ANSWERS

Chapter 1 MULTI-DIGIT WHOLE NUMBERS

Exercise 1A Numbers to 1,000,000

1. 435,286

2. **(a)** six hundred eighty thousand, five hundred forty-two

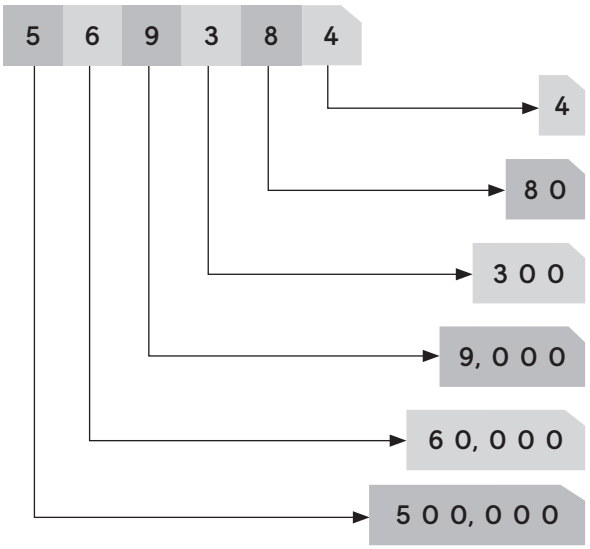
(b) nine hundred nine thousand, three hundred ten

3. **(a)** ten thousands **(b)** 3

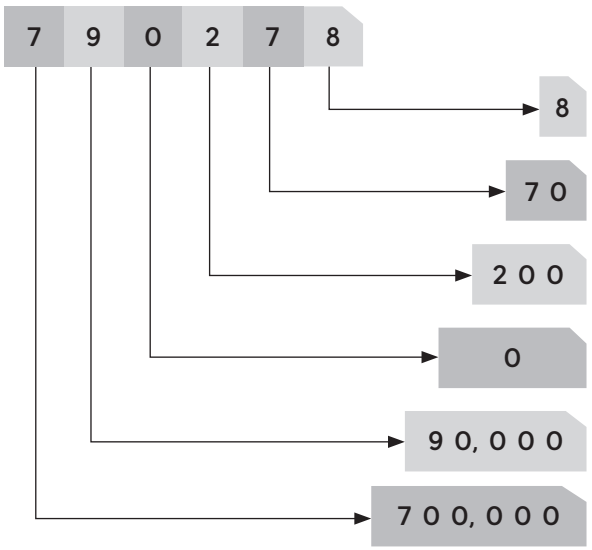
(c) 8,000

(d) 900,000

4. **(a)**



(b)



5. **(a)** 5,000 **(b)** 500,000

(c) 50,000

6. **(a)** 7,000 **(b)** 80,000 **(c)** 73,820

Exercise 1B Compare and Order Numbers

1. **(a)** < **(b)** >

2. **(a)**

	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
86,027		8	6	0	2	7
186,072	1	8	6	0	7	2
86,207		8	6	2	0	7

(b) 86,027 (least), 86,207, 186,072 (greatest)

3. 359,283

4. 964,758

5. 547,683 (least), 574,386, 574,863, 578,436 (greatest)

6. 796,508 (greatest), 796,085, 790,658, 769,805 (least)

7. I disagree with Andrew. With the first digit being zero, his answer is a 4-digit number instead of a 5-digit number.
The least 5-digit number that can be formed using the digits given is 20,459.

8. **(a)** 30,687 **(b)** 36,780

(c) 87,603 **(d)** 87,360

Exercise 1C Number and Shape Patterns

1. **(a)** 15,390, 16,390, 17,390, 18,390, 19,390

Rule: Start with 15,390. Add 1,000.

(b) 62,980, 62,880, 62,780, 62,680, 62,580

Rule: Start with 62,980. Subtract 100.

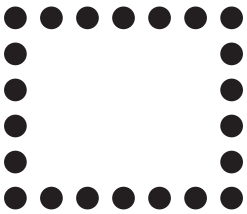
2. 2,380, 2,580, 2,550, 2,750, 2,720

3. **(a)**

Figure	Pattern	Total Number of Squares
1	2 + 3	5
2	2 + 3 + 3	8
3	2 + 3 + 3 + 3	11
4	**2 + 3 + 3 + 3 + 3**	**14**
5	**2 + 3 + 3 + 3 + 3 + 3**	**17**

(b) The number of squares increases by 3 in the next pattern.

4. **(a)**



(b) Figure 5 = 18 + 4 = 22
Figure 6 = 22 + 4 = 26

Figure	1	2	3	4	5	6
Number of Dots	6	10	14	18	22	26

(c) The number of dots increases by 4 in the next pattern.

Exercise ID Rounding Numbers (1)

1. **(a)** 54,000 **(b)** 188,000

2. **(a)** $49,000 **(b)** $70,000
(c) $112,000

3. 13,000

4. 50,000

5. **(a)** 4,500 **(b)** 5,499

6. **(a)** 47,538 **(b)** 48,375

7.

The least possible number is 29,950.

Exercise ID Rounding Numbers (2)

1. 20,000

2. 400,000

3. **(a)** 70,000 **(b)** 180,000

4. **(a)** 500,000 **(b)** 800,000

5. **(a)** 480,000 grams **(b)** 640,000 grams

6. **(a)** 600,000 liters **(b)** 700,000 liters

7.

		Nearest Hundred Thousand	Nearest Ten Thousand	Nearest Thousand
(a)	137,600	100,000	140,000	138,000
(b)	254,350	300,000	250,000	254,000
(c)	539,860	500,000	540,000	540,000

8. **(a)** 384,000 km (nearest thousand);
380,000 km (nearest ten thousand);
400,000 km (nearest hundred thousand)

(b) The closest is 384,000 kilometers, which is the answer when rounded to the nearest thousand.
The answer is the most accurate when rounded to the least place value as it is the closest to the actual number.

Chapter Practice

1. C

2. B

3. D

4. D

5. B

6. 100,000

7. **(a)** 24,519 **(b)** 25,491

8. I do not agree with Felicia.
Accept all correct explanations. Example:
In the expanded form,
28,450 = 28,000 + 400 + 50
We read it as twenty-eight thousand, four hundred fifty.
There are 28 thousands in 28,450.

9. I start off by writing the four numbers in a place-value chart.

	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
957,263	9	5	7	2	6	3
952,736	9	5	2	7	3	6
957,326	9	5	7	3	2	6
975,623	9	7	5	6	2	3

First, I compare the digits in the hundred thousands place. They are the same.

I move on to compare the digits in the ten thousands place.
7 ten thousands are more than 5 ten thousands.
So, 975,623 is the greatest number.

Next, I compare the digits in the thousands place for the remaining numbers.
2 thousands are less than 3 thousands and 7 thousands.
So, 952,736 is the least number.

Next, I compare the digits in the hundreds place for the remaining two numbers.
Between 957,263 and 957,326, 957,263 is less since 2 hundreds are less than 3 hundreds.

I can now order them accordingly.
952,736, 957,263, 957,326, 975,623
least greatest

10. (a)

Figure	Number of Squares	Number of Triangles
1	3	3
2	5	5
3	7	7

(b) Accept all correct answers. Examples:
The number of squares is the same as the number of triangles.
The number of squares increases by 2 from the previous figure.
The number of triangles increases by 2 from the previous figure.

(c) Number of squares = 7 + 2 + 2
= 11
Number of triangles = 7 + 2 + 2
= 11
Figure 5 has 11 squares and 11 triangles.

11. (a)

Figure	1	2	3	4
Number of Squares	3	8	15	24

(b) I notice:
Figure 1: 1 × 3 = 3
Figure 2: 2 × 4 = 8
Figure 3: 3 × 5 = 15
Figure 4: 4 × 6 = 24

The pattern to find the number of squares is:

Figure number × (Figure number + 2)

(c) 9 × 11 = 99
Figure 9 has 99 squares.

Chapter 2 ADDITION AND SUBTRACTION

Exercise 2A Add Multi-Digit Whole Numbers

1. (a)
$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ \ } \\ 2836 \\ +\ 3218 \\ \hline 6054 \end{array}$$

(b)
$$\begin{array}{r} 32318 \\ +\ 15471 \\ \hline 47789 \end{array}$$

(c)
$$\begin{array}{r} 506503 \\ +\ 342393 \\ \hline 848896 \end{array}$$

(d)
$$\begin{array}{r} {\scriptstyle \ \ 1\ \ 1\ \ } \\ 71345 \\ +\ 65928 \\ \hline 137273 \end{array}$$

(e)
$$\begin{array}{r} {\scriptstyle 1\ \ \ \ 1\ 1\ } \\ 196594 \\ +\ \ 52367 \\ \hline 248961 \end{array}$$

(f)
$$\begin{array}{r} {\scriptstyle \ \ 1\ \ \ 1\ 1\ } \\ 276384 \\ +\ 342975 \\ \hline 619359 \end{array}$$

2. **(a)** 35,374 + 2,816 = 38,190

$$\begin{array}{r} {\scriptstyle 1\ \ 1} \\ 35374 \\ +\ \ 2816 \\ \hline 38190 \end{array}$$

(b) 38,567 + 92,468 = 131,035

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1\ 1} \\ 38567 \\ +\ 92468 \\ \hline 131035 \end{array}$$

(c) 563,825 + 33,685 = 597,510

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ 563825 \\ +\ \ 33685 \\ \hline 597510 \end{array}$$

(d) 407,852 + 398,348 = 806,200

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1\ 1\ 1} \\ 407852 \\ +\ 398348 \\ \hline 806200 \end{array}$$

3. **(a)** Accept all correct answers. Examples:

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ 10468 \\ +\ 23579 \\ \hline 34047 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\ 1\ 1} \\ 20569 \\ +\ 13478 \\ \hline 34047 \end{array}$$

(b) Accept all correct answers. Examples:

$$\begin{array}{r} {\scriptstyle 1} \\ 97531 \\ +\ \ 86420 \\ \hline 183951 \end{array}$$

$$\begin{array}{r} {\scriptstyle 1} \\ 87521 \\ +\ \ 96430 \\ \hline 183951 \end{array}$$

4.

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1\ 1} \\ 34457 \\ +\ 28698 \\ \hline 63155 \end{array}$$

Exercise 2B Subtract Multi-Digit Whole Numbers

1. **(a)**

$$\begin{array}{r} {\scriptstyle 6\ 10\ 10\ 10} \\ {\scriptstyle 7\ 0\ 0\ 0} \\ -\ 2358 \\ \hline 4642 \end{array}$$

(b)

$$\begin{array}{r} 65824 \\ -\ 32704 \\ \hline 33120 \end{array}$$

(c)

$$\begin{array}{r} {\scriptstyle 3\ 12\ \ \ 1\ 10} \\ {\scriptstyle 4\ 2\ 8\ 2\ 0} \\ -\ \ 7203 \\ \hline 35617 \end{array}$$

(d)

$$\begin{array}{r} {\scriptstyle 8\ 10\ 9\ 12\ 14} \\ {\scriptstyle 9\ 0\ 1\ 3\ 4} \\ -\ 74658 \\ \hline 15476 \end{array}$$

(e)

$$\begin{array}{r} {\scriptstyle 2\ 10\ 1\ 4\ 9\ 10} \\ {\scriptstyle 3\ 0\ 2\ 5\ 1\ 0} \\ -\ \ 43698 \\ \hline 258812 \end{array}$$

(f)

$$\begin{array}{r} {\scriptstyle 5\ 10\ 4\ 2\ 9\ 14} \\ {\scriptstyle 6\ 0\ 5\ 3\ 1\ 4} \\ -\ 283546 \\ \hline 321768 \end{array}$$

2. **(a)** 46,352 − 17,890 = 28,462

$$\begin{array}{r} {\scriptstyle 3\ 15\ 12} \\ {\scriptstyle 4\ 6\ 3\ 5\ 2} \\ -\ 17890 \\ \hline 28462 \end{array}$$

(b) 253,014 − 65,283 = 187,731

$$\begin{array}{r} {\scriptstyle 1\ 14\ 12\ 9} \\ {\scriptstyle 2\ 5\ 3\ 0\ 1\ 4} \\ -\ \ 65283 \\ \hline 187731 \end{array}$$

(c) 819,324 − 375,566 = 443,758

$$\begin{array}{r} {\scriptstyle 7\ 11\ 8\ 12\ 11\ 14} \\ {\scriptstyle 8\ 1\ 9\ 3\ 2\ 4} \\ -\ 375566 \\ \hline 443758 \end{array}$$

(d) 546,000 − 175,328 = 370,672

```
   4  14  5  9  9  10
   5  4  6  0  0  0
 − 1  7  5  3  2  8
 ---------------------
   3  7  0  6  7  2
```

3. **(a)**

```
   9  8  7  6  5
 − 1  0  2  3  4
 ---------------
   8  8  5  3  1
```

(b)

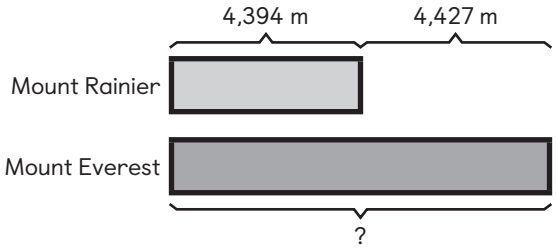
```
   2  9  10  10  13  15
   3  0  1   4   5
 − 2  9  8   7   6
 ----------------------
      2  6   9
```

4. The greatest 6-digit even number is 987,534.
The least 6-digit even number is 345,798.
987,534 − 345,798 = 641,736

```
      6  14  12  14
   9  8  7   5   3   4
 − 3  4  5   7   9   8
 ---------------------
   6  4  1   7   3   6
```

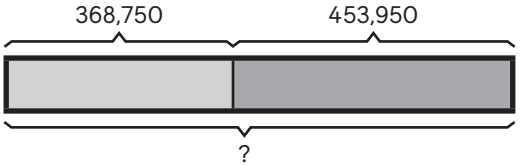
Exercise 2C Word Problems (1)

1.



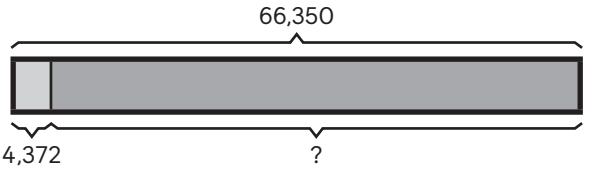
4,394 + 4,427 = 8,821
Mount Everest is 8,821 meters tall.

2.



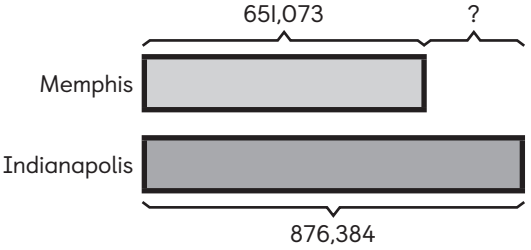
368,750 + 453,950 = 822,700
The factory produced 822,700 robots in the two months.

3.



66,350 − 4,372 = 61,978
There are 61,978 adults.

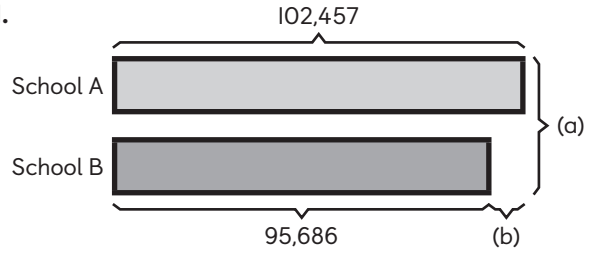
4.



876,384 − 651,073 = 225,311
There are 225,311 more people in Indianapolis than Memphis.

Exercise 2C Word Problems (2)

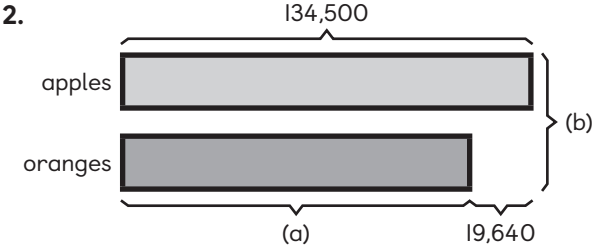
1.



(a) 102,457 + 95,686 = 198,143
The two schools sell 198,143 flags.

(b) 102,457 − 95,686 = 6,771
School A sells 6,771 more flags than School B.

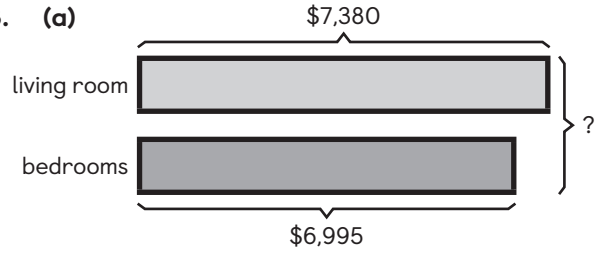
2.



(a) 134,500 − 19,640 = 114,860
The farm produced 114,860 oranges.

(b) 134,500 + 114,860 = 249,360
The farm produced 249,360 apples and oranges altogether.

3. **(a)**



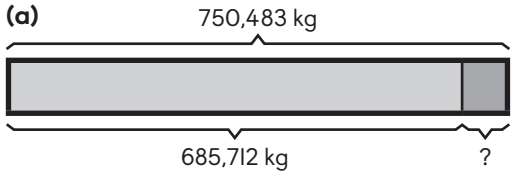
7,380 + 6,995 = 14,375

Angelia needs $14,375 altogether.

(b) 14,375 − 12,500 = 1,875

Angelia exceeded her budget by $1,875.

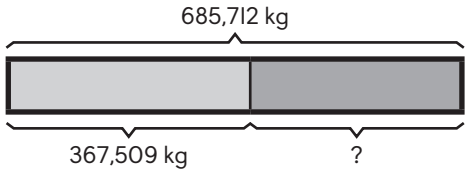
4. **(a)**



750,483 − 685,712 = 64,771

There are 64,771 kilograms of plastic.

(b)

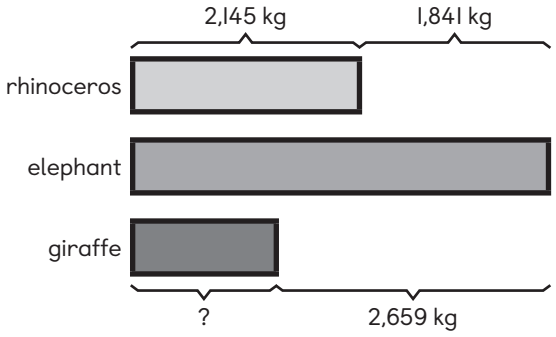


685,712 − 367,509 = 318,203

318,203 kilograms of metal are left.

Exercise 2C Word Problems (3)

1.



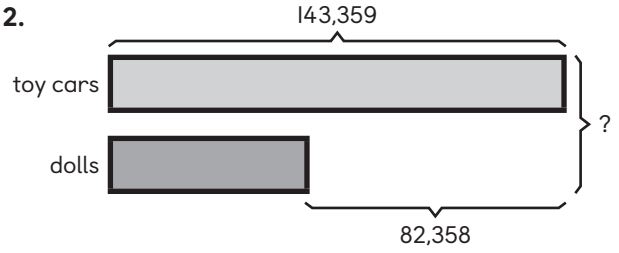
2,145 + 1,841 = 3,986

The mass of the elephant is 3,986 kilograms.

3,986 − 2,659 = 1,327

The mass of the giraffe is 1,327 kilograms.

2.



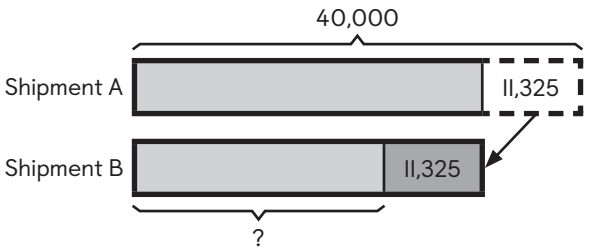
143,359 − 82,358 = 61,001

The factory produced 61,001 dolls.

143,359 + 61,001 = 204,360

The factory produced 204,360 toy cars and dolls altogether.

3.



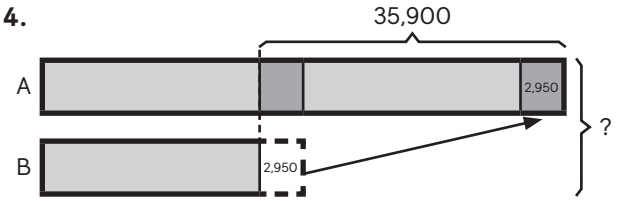
11,325 + 11,325 = 22,650

Shipment A had 22,650 more books than Shipment B at first.

40,000 − 22,650 = 17,350

Shipment B had 17,350 books at first.

4.



35,900 − 2,950 − 2,950 = 30,000

Building B had 30,000 visitors at first.

30,000 + 30,000 + 30,000 = 90,000

There were 90,000 visitors in the two buildings altogether.

Chapter Practice

1. C

2. A

3. B

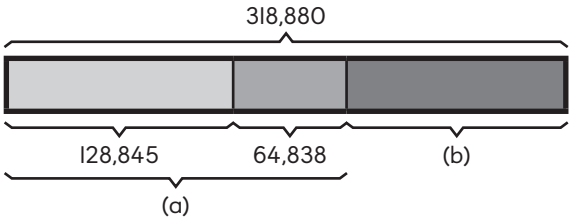
4. C

5. B

6. 37,472

7. 93,852

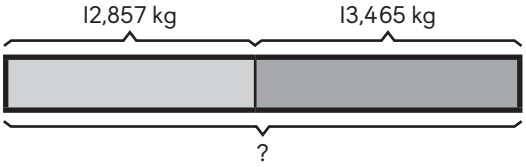
8.



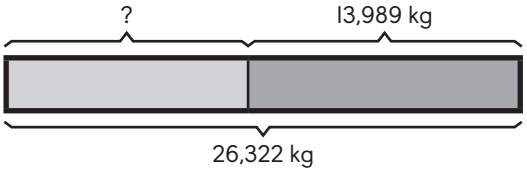
(a) 128,845 + 64,838 = 193,683
The center has 193,683 T-shirts and dresses altogether.

(b) 318,880 − 193,683 = 125,197
The center has 125,197 pairs of shorts.

9.



12,857 + 13,465 = 26,322
The factory produced 26,322 kilograms of nuts.



26,322 − 13,989 = 12,333
12,333 kilograms of nuts were sold.

10. The first two digits of the numbers have to be 8 and 7.
The numbers are 87,521, 87,512, 87,251, 87,215, 87,152, and 87,125.
The greatest number is 87,521.
The least number is 87,125.
Difference = 87,521 − 87,125
= 396

$$\begin{array}{r} \overset{\scriptscriptstyle 11}{} \\ 8\,7\,\overset{\scriptscriptstyle 4}{\cancel{5}}\,\overset{\scriptscriptstyle 1}{\cancel{2}}\,\overset{\scriptscriptstyle 11}{\cancel{1}} \\ -\;8\,7\,1\,2\,5 \\ \hline 3\,9\,6 \end{array}$$

11. **(a)** 22,500 + 36,800 + 36,800 = 96,100
Sandi had a score of 96,100.
35,000 + 26,400 + 26,400 = 87,800
Larry had a score of 87,800.
Sandi's score was higher.
No, Sandi's score was less than 100,000.
A prize was won only if the score was at least 100,000 points.

(b)

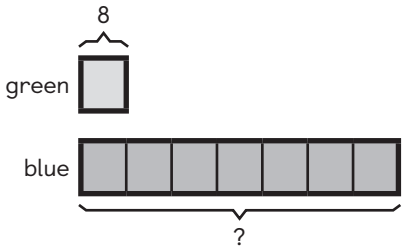
Target 1	Target 2	Target 3	Total Score
Rooster	Rooster	Cat	36,800 + 36,800 + 22,500 = 96,100 (✗)
Duck	Duck	Rabbit	35,000 + 35,000 + 26,400 = 96,400 (✗)
Rooster	Rooster	Rabbit	36,800 + 36,800 + 26,400 = 100,000 (✓)

Moses hit two roosters and one rabbit.

Chapter 3 MULTIPLICATION AND DIVISION

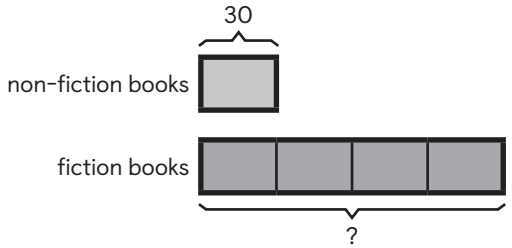
Exercise 3A Multiplicative Comparisons

1.



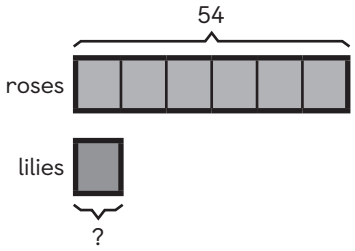
8 × 7 = 56
Wilson has 56 blue marbles.

2.



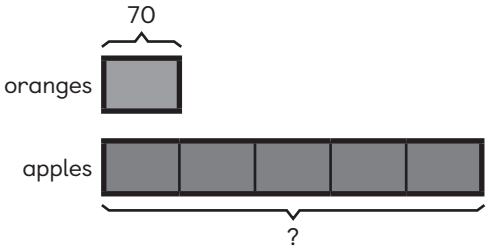
30 × 4 = 120
There are 120 fiction books in the class library.

3.



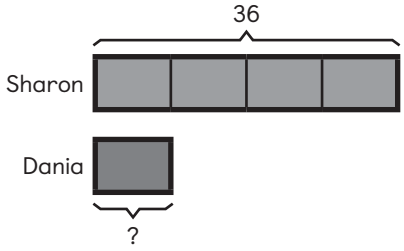
54 ÷ 6 = 9
The florist has 9 lilies.

4.



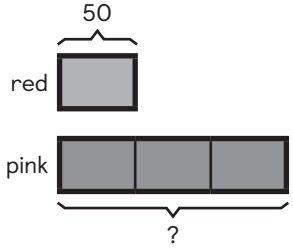
70 × 5 = 350
The grocer sold 350 apples.

5.



36 ÷ 4 = 9
Dania has 9 hairpins.

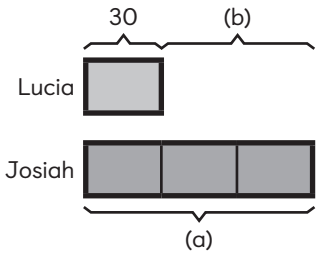
6.



50 × 3 = 150
Jacob prepared 150 pink balloons.

Exercise 3B Word Problems

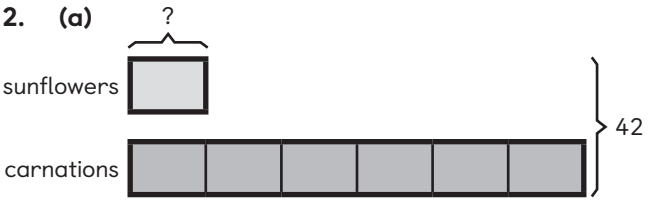
1.



(a) 30 × 3 = 90
Josiah has 90 pennies.

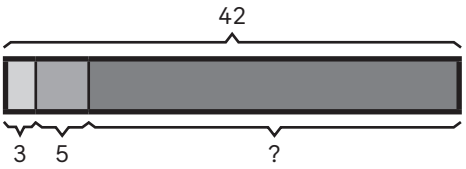
(b) 90 − 30 = 60
Lucia has 60 fewer pennies than Josiah.

2. (a)



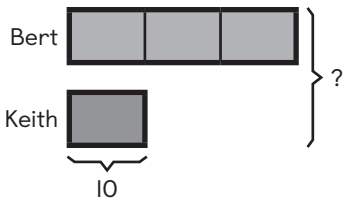
42 ÷ 7 = 6
Lorenzo bought 6 sunflowers.

(b)

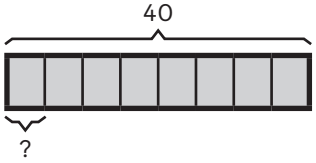


42 − 5 − 3 = 34
Lorenzo had 34 flowers left.

3.

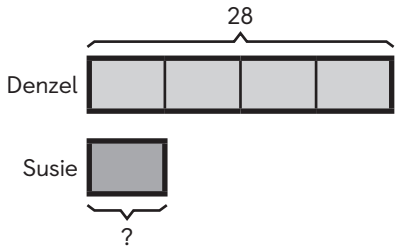


10 × 4 = 40
Keith and Bert baked 40 cinnamon rolls altogether.

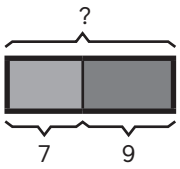


40 ÷ 8 = 5
Each friend received 5 cinnamon rolls.

4.

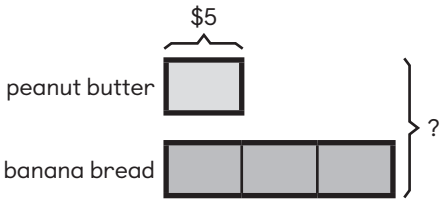


4 units = 28
1 unit = 28 ÷ 4
= 7



7 + 9 = 16
Susie had 16 granola bars in the end.

5. 5 × 3 = 15
The cost of 3 more jars of peanut butter that Ms. Hitcher bought was $15.
90 − 15 = 75
Ms. Hitcher paid less than $75 for the same number of jars of peanut butter and boxes of banana bread.

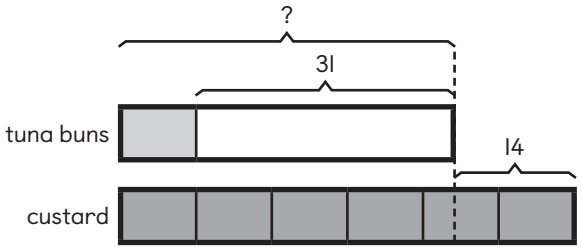


5 × 4 = 20
A set of 1 jar of peanut butter and 1 box of banana bread cost $20.

Number of Sets	Total Cost	Check
1	20 × 1 = 20	✔
2	20 × 2 = 40	✔
3	20 × 3 = 60	✔
4	20 × 4 = 80	✗

Ms. Hitcher paid $60 for 3 jars of peanut butter and 3 boxes of banana bread.
Ms. Hitcher bought 3 boxes of banana bread.

6.



5 units = 31 + 14
= 45
1 unit = 45 ÷ 5
= 9
9 + 31 = 40
40 tuna buns were baked in the morning.

Exercise 3C Factors, Multiples, and Prime Numbers (1)

1. The factors of 18 are 1, 2, 3, 6, 9, and 18.

2. **(a)** 12 = 1 × 12
12 = 2 × 6
12 = 3 × 4

The factors of 12 are 1, 2, 3, 4, 6, and 12.

(b) 30 = 1 × 30
30 = 2 × 15
30 = 3 × 10
30 = 5 × 6

The factors of 30 are 1, 2, 3, 5, 6, 10, 15, and 30.

3. **(a)** 24 = 1 × 24
24 = 2 × 12
24 = 3 × 8
24 = 4 × 6

56 = 1 × 56
56 = 2 × 28
56 = 4 × 14
56 = 7 × 8

The factors of 24 are 1, 2, 3, 4, 6, 8, 12, and 24.
The factors of 56 are 1, 2, 4, 7, 8, 14, 28, and 56.
The common factors of 24 and 56 are 1, 2, 4, and 8.

(b) $45 = 1 \times 45$
$45 = 3 \times 15$
$45 = 5 \times 9$

$60 = 1 \times 60$
$60 = 2 \times 30$
$60 = 3 \times 20$
$60 = 4 \times 15$
$60 = 5 \times 12$
$60 = 6 \times 10$

The factors of 45 are 1, 3, 5, 9, 15, and 45.
The factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60.
The common factors of 45 and 60 are 1, 3, 5, and 15.

Exercise 3C Factors, Multiples, and Prime Numbers (2)

1. 3 is the first multiple of 3.
6 is the second multiple of 3.
9 is the third multiple of 3.
12 is the fourth multiple of 3.

The first four multiples of 3 are 3, 6, 9, and 12.

2.

Number	Multiples
4	4, 8, 12, 16, 20
5	5, 10, 15, 20, 25
7	7, 14, 21, 28, 35
9	9, 18, 27, 36, 45

3.

		Yes or **No**
(a)	32 is a multiple of 6.	No
(b)	49 is a multiple of 7.	Yes
(c)	28 is a multiple of 9.	No
(d)	46 is a multiple of 8.	No

4. **(a)** 9, 18, 27, 36, 45, 54, 63, 72

(b) $1 + 8 = 9$
$2 + 7 = 9$
$3 + 6 = 9$
$4 + 5 = 9$
$5 + 4 = 9$
$6 + 3 = 9$
$7 + 2 = 9$

(c) The multiples of 9 have digits that add up to 9.

5. **(a)** Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
Multiples of 5: 5, 10, 15, 20, 25, 30, 35
The first two common multiples of 3 and 5 are 15 and 30.

(b) Multiples of 10: 10, 20, 30, 40
Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
The first two common multiples of 4 and 10 are 20 and 40.

6. No, 35 is not a common multiple of 7 and 4 because 35 cannot be divided exactly by 4.

Exercise 3C Factors, Multiples, and Prime Numbers (3)

1.

Prime Numbers	Composite Numbers
19	26
31	38
37	49
61	51
71	69

2. **(a)** 37, 41, 43

(b) $37 = 1 \times 37$
$41 = 1 \times 41$
$43 = 1 \times 43$

37, 41, and 43 are numbers which have exactly two factors, 1 and the number itself.

3. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

4. **(a)** 21, 33, 39, 51

(b) Factors of 21 are: 1, 3, 7, and 21
Factors of 33 are: 1, 3, 11, and 33
Factors of 39 are: 1, 3, 13, and 39
Factors of 51 are: 1, 3, 17, and 51

21, 33, 39, and 51 are numbers which have more than two factors.

5. **(a)** 32, 33, 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49

(b) We look at the number of factors the number has. 31 is a prime number because it has exactly 2 factors, 1 and itself. 32 is a composite number because it has more than two factors.

6. No. All even numbers except 2 are composite as they have more than two factors. 2 is a prime number as it has exactly two factors.

Exercise 3D Multiply by Tens, Hundreds, and Thousands

1. 4 tens × 6 = 24 tens
40 × 6 = 240

2. 6 hundreds × 5 = 30 hundreds
600 × 5 = 3,000

3. 8 thousands × 4 = 32 thousands
8,000 × 4 = 32,000

4. **(a)** 10 × 8 = 80
100 × 8 = 800
1,000 × 8 = 8,000

(b) 10 × 6 = 60
100 × 6 = 600
1,000 × 6 = 6,000

(c) 6 × 70 = 420
6 × 700 = 4,200
6 × 7,000 = 42,000

(d) 8 × 60 = 480
8 × 600 = 4,800
8 × 6,000 = 48,000

(e) 9 × 30 = 270
9 × 300 = 2,700
9 × 3,000 = 27,000

(f) 5 × 80 = 400
5 × 800 = 4,000
5 × 8,000 = 40,000

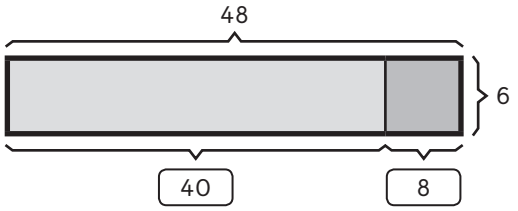
5. 9,000 × 4 = 9 thousands × 4
= 36 thousands
= 36,000

40 × 90 = 4 tens × 90
= 360 tens
= 3,600
No, they are not the same.

Exercise 3E Multiply a 2-Digit Number by a 1-Digit Number

1. **(a)** 52 × 4 = (50 × 4)
+ (2 × 4)
= 200 + 8
= 208

(b)



48 × 6 = (40 × 6)
+ (8 × 6)
= 240 + 48
= 288

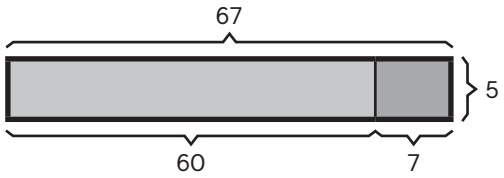
2. **(a)**
$$\begin{array}{r} 72 \\ \times\ \ 4 \\ \hline 288 \end{array}$$

(b)
$$\begin{array}{r} 82 \\ \times\ \ 3 \\ \hline 246 \end{array}$$

(c)
$$\begin{array}{r} {\scriptstyle 3}\ \ \\ 55 \\ \times\ \ 6 \\ \hline 330 \end{array}$$

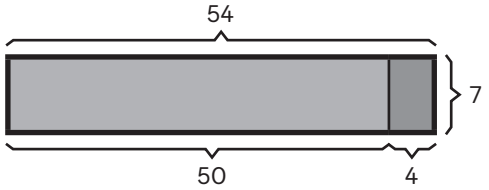
(d)
$$\begin{array}{r} {\scriptstyle 2}\ \ \\ 97 \\ \times\ \ 3 \\ \hline 291 \end{array}$$

3. **(a)** 67 × 5 = 335



(60 × 5) + (7 × 5)
= 300 + 35
= 335

(b) 54 × 7 = 378



(50 × 7) + (4 × 7)
= 350 + 28
= 378

4. **(a)** 87 × 4 = 348

$$\begin{array}{r} {\scriptstyle 2} \\ 87 \\ \times\ \ 4 \\ \hline 348 \end{array}$$

(b) 83 × 8 = 664

$$\begin{array}{r} {\scriptstyle 2} \\ 83 \\ \times\ \ 8 \\ \hline 664 \end{array}$$

(c) 39 × 9 = 351

$$\begin{array}{r} {\scriptstyle 8} \\ 39 \\ \times\ \ 9 \\ \hline 351 \end{array}$$

(d) 96 × 3 = 288

$$\begin{array}{r} {\scriptstyle 1} \\ 96 \\ \times\ \ 3 \\ \hline 288 \end{array}$$

(e) 65 × 7 = 455

$$\begin{array}{r} {\scriptstyle 3} \\ 65 \\ \times\ \ 7 \\ \hline 455 \end{array}$$

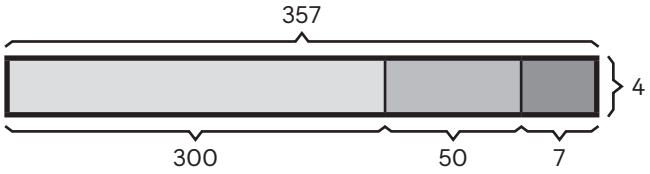
(f) 78 × 5 = 390

$$\begin{array}{r} {\scriptstyle 4} \\ 78 \\ \times\ \ 5 \\ \hline 390 \end{array}$$

Exercise 3F Multiply a 3-Digit or a 4-Digit Number by a 1-Digit Number

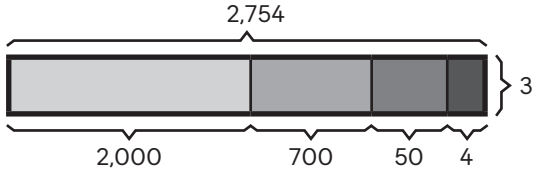
1. 246 × 8 = (200 × 8) + (40 × 8) + (6 × 8)
= 1,600 + 320 + 48
= 1,968

2. **(a)** 357 × 4 = 1,428



357 × 4 = (300 × 4) + (50 × 4) + (7 × 4)
= 1,200 + 200 + 28
= 1,428

(b) 2,754 × 3 = 8,262



2,754 × 3 = (2,000 × 3) + (700 × 3) + (50 × 3) + (4 × 3)
= 6,000 + 2,100 + 150 + 12
= 8,262

3. **(a)**

$$\begin{array}{r} {\scriptstyle 3}\ {\scriptstyle 3} \\ 167 \\ \times\ \ 5 \\ \hline 835 \end{array}$$

(b)

$$\begin{array}{r} {\scriptstyle 3}\ {\scriptstyle 4} \\ 146 \\ \times\ \ 7 \\ \hline 1022 \end{array}$$

(c)

$$\begin{array}{r} {\scriptstyle 3}\ {\scriptstyle 3} \\ 1665 \\ \times\ \ 6 \\ \hline 9990 \end{array}$$

(d)

$$\begin{array}{r} {\scriptstyle 7}\ {\scriptstyle 3}\ {\scriptstyle 6} \\ 2837 \\ \times\ \ 9 \\ \hline 25533 \end{array}$$

4. **(a)** 1,638 × 7 = 11,466

$$\begin{array}{r} {\scriptstyle 4}\ {\scriptstyle 2}\ {\scriptstyle 5} \\ 1638 \\ \times\ \ 7 \\ \hline 11466 \end{array}$$

(b) 3,726 × 5 = 18,630

$$\begin{array}{r} {\scriptstyle 3}\ {\scriptstyle 1}\ {\scriptstyle 3} \\ 3726 \\ \times\ \ 5 \\ \hline 18630 \end{array}$$

(c) 2,507 × 6 = 15,042

$$\begin{array}{r} {\scriptstyle 3}\ \ {\scriptstyle 4} \\ 2507 \\ \times\ \ 6 \\ \hline 15042 \end{array}$$

(d) 2,356 × 8 = 18,848

$$\begin{array}{r} {\scriptstyle 2}\ {\scriptstyle 4}\ {\scriptstyle 4} \\ 2356 \\ \times\ \ 8 \\ \hline 18848 \end{array}$$

(e) 3,175 × 9 = 28,575

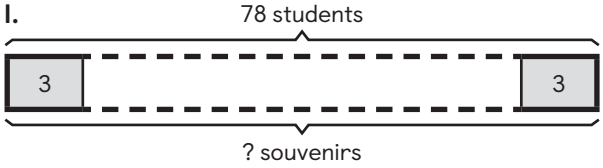
$$\begin{array}{r} {\scriptstyle 1}\ {\scriptstyle 6}\ {\scriptstyle 4} \\ 3175 \\ \times\ \ 9 \\ \hline 28575 \end{array}$$

(f) 4,053 × 7 = 28,371

$$\begin{array}{r} {\scriptstyle 3}\ {\scriptstyle 2} \\ 4053 \\ \times\ \ 7 \\ \hline 28371 \end{array}$$

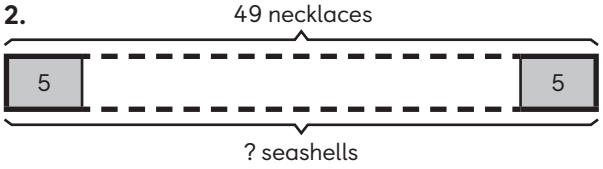
Exercise 3G Word Problems

1.



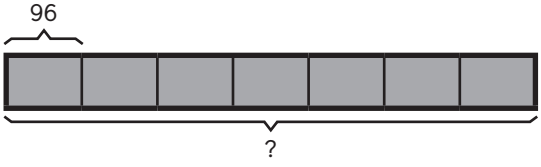
78 × 3 = 234
234 souvenirs were given to all the students.

2.



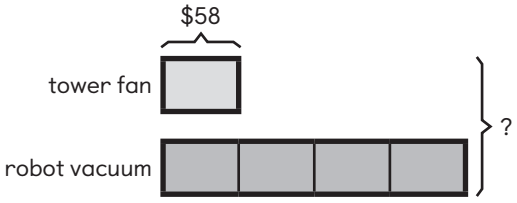
49 × 5 = 245
Abigail uses 245 seashells altogether.

3.



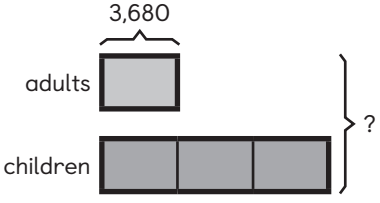
96 × 7 = 672
The coffeeshop sells 672 sandwiches in a week.

4.



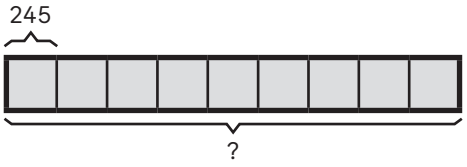
58 × 5 = 290
The total cost of a tower fan and a robot vacuum is $290.

5.



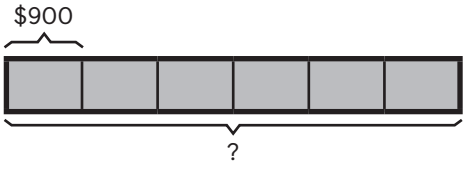
3,680 × 4 = 14,720
There were 14,720 adults and children altogether.

6.



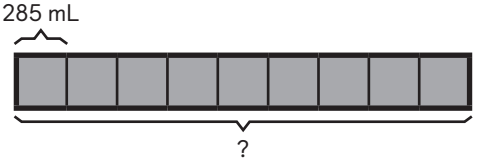
245 × 9 = 2,205
Mr. Moore gave 2,205 craft sticks to his students altogether.

7.



900 × 6 = 5,400
Ms. Davy will save $5,400 in half a year.
Yes, she will save enough money for the trip.

8.



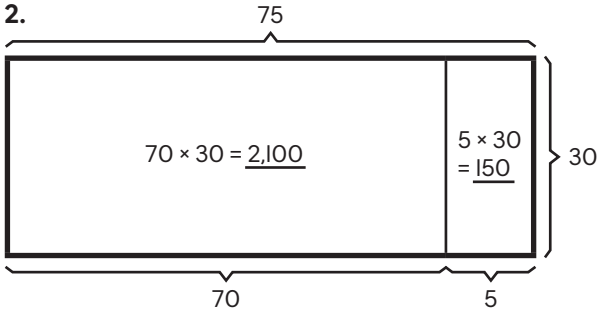
285 × 9 = 2,565
9 cups can hold 2,565 milliliters altogether.
Yes, Emilia has enough juice to fill the 9 cups completely.

Exercise 3H Multiply a 2-Digit Number by a 2-Digit Number

1. 36 × 10 = 360 360 × 2 = 720

So, 36 × 20 = 720.

2.



75 × 30 = 2,100 + 150
= 2,250

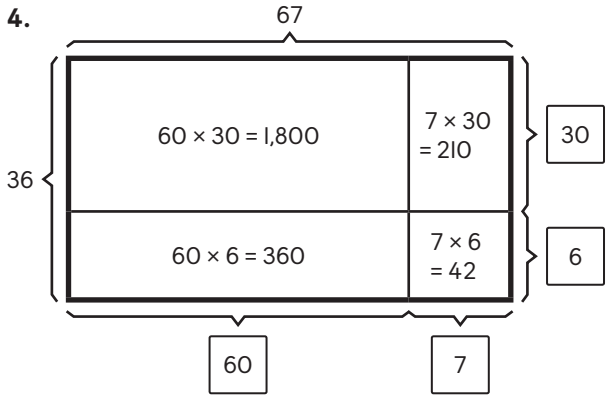
3. **(a)** 48 × 10 = 480

(b) 58 × 60 = 58 × 6 × 10
= 348 × 10
= 3,480

(c) 86 × 50 = 86 × 5 × 10
= 430 × 10
= 4,300

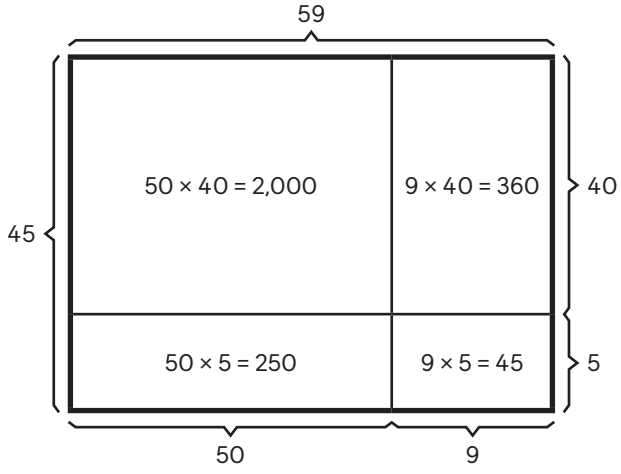
(d) 46 × 70 = 46 × 7 × 10
= 322 × 10
= 3,220

4.



67 × 36 = 1,800 + 210 + 360 + 42
= 2,412

5. 59 × 45 = 2,655



59 × 45 = 2,000 + 360 + 250 + 45
= 2,655

6. **(a)** 47 × 54 = 2,538

$$\begin{array}{r} {\scriptstyle 3\ 2\ \ } \\ 4\ 7 \\ \times\quad 5\ 4 \\ \hline 1\ 8\ 8 \\ 2\ 3\ 5\ 0 \\ \hline 2\ 5\ 3\ 8 \end{array}$$

(b) 76 × 37 = 2,812

$$\begin{array}{r} {\scriptstyle 1\ 4\ \ } \\ 7\ 6 \\ \times\quad 3\ 7 \\ \hline 5\ 3\ 2 \\ 2\ 2\ 8\ 0 \\ \hline 2\ 8\ 1\ 2 \end{array}$$

(c) 72 × 76 = 5,472

$$\begin{array}{r} {\scriptstyle 1\ 1\ \ } \\ 7\ 2 \\ \times\quad 7\ 6 \\ \hline 4\ 3\ 2 \\ 5\ 0\ 4\ 0 \\ \hline 5\ 4\ 7\ 2 \end{array}$$

(d) 58 × 94 = 5,452

$$\begin{array}{r} {\scriptstyle 7\ 3\ \ } \\ 5\ 8 \\ \times\quad 9\ 4 \\ \hline 2\ 3\ 2 \\ 5\ 2\ 2\ 0 \\ \hline 5\ 4\ 5\ 2 \end{array}$$

Exercise 3I Quotient and Remainder

1. **(a)**

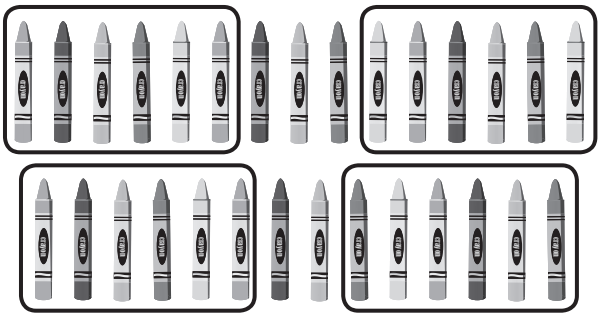
19 ÷ 4 = 4 R 3

Quotient = 4 Remainder = 3

Each child gets 4 stars.

There are 3 stars left.

(b)



29 ÷ 6 = 4 R 5

Quotient = 4 Remainder = 5

Each child gets 4 crayons.

There are 5 crayons left.

2. **(a)** 45 ÷ 6 = 7 R 3

```
    7 R 3
6 ) 4 5
    4 2
    ---
      3
```

Quotient = 7 Remainder = 3

(b) 60 ÷ 7 = 8 R 4

```
    8 R 4
7 ) 6 0
    5 6
    ---
      4
```

Quotient = 8 Remainder = 4

(c) 79 ÷ 9 = 8 R 7

```
    8 R 7
9 ) 7 9
    7 2
    ---
      7
```

Quotient = 8 Remainder = 7

3.

```
    4 R 6
8 ) ? ?
    3 2
    ---
      6
```

8 × 4 = 32
32 + 6 = 38
The number is 38.

Exercise 3J Divide a 2-Digit Number by a 1-Digit Number

1. **(a)** 50 ÷ 2 = 25

```
    2 5
2 ) 5 0
    5 0
    ---
      0
```

(b) 55 ÷ 4 = 13 R 3

```
    1 3 R 3
4 ) 5 5
    4
    ---
    1 5
    1 2
    ---
      3
```

2. **(a)**

```
    3 4
2 ) 6 8
    6
    ---
      8
      8
      ---
      0
```

(b)

```
    2 9
3 ) 8 7
    6
    ---
    2 7
    2 7
    ---
      0
```

(c)

```
    1 7
5 ) 8 5
    5
    ---
    3 5
    3 5
    ---
      0
```

(d)

```
    1 2
8 ) 9 6
    8
    ---
    1 6
    1 6
    ---
      0
```

(e)

```
    1 2 R 3
7 ) 8 7
    7
    ---
    1 7
    1 4
    ---
      3
```

(f)

```
    2 2 R 2
4 ) 9 0
    8
    ---
    1 0
      8
      ---
      2
```

(g)
$$\begin{array}{r} 27\ \text{R}\ 1 \\ 2\overline{)55} \\ 4 \\ \hline 15 \\ 14 \\ \hline 1 \end{array}$$

(h)
$$\begin{array}{r} 15\ \text{R}\ 3 \\ 6\overline{)93} \\ 6 \\ \hline 33 \\ 30 \\ \hline 3 \end{array}$$

(i)
$$\begin{array}{r} 23\ \text{R}\ 1 \\ 3\overline{)70} \\ 6 \\ \hline 10 \\ 9 \\ \hline 1 \end{array}$$

(j)
$$\begin{array}{r} 16\ \text{R}\ 2 \\ 5\overline{)82} \\ 5 \\ \hline 32 \\ 30 \\ \hline 2 \end{array}$$

3. **(a)** 30 ÷ 2 = 15
$$\begin{array}{r} 15 \\ 2\overline{)30} \\ 2 \\ \hline 10 \\ 10 \\ \hline 0 \end{array}$$

(b) 57 ÷ 3 = 19
$$\begin{array}{r} 19 \\ 3\overline{)57} \\ 3 \\ \hline 27 \\ 27 \\ \hline 0 \end{array}$$

(c) 80 ÷ 5 = 16
$$\begin{array}{r} 16 \\ 5\overline{)80} \\ 5 \\ \hline 30 \\ 30 \\ \hline 0 \end{array}$$

(d) 76 ÷ 3 = 25 R 1
$$\begin{array}{r} 25\ \text{R}\ 1 \\ 3\overline{)76} \\ 6 \\ \hline 16 \\ 15 \\ \hline 1 \end{array}$$

(e) 62 ÷ 5 = 12 R 2
$$\begin{array}{r} 12\ \text{R}\ 2 \\ 5\overline{)62} \\ 5 \\ \hline 12 \\ 10 \\ \hline 2 \end{array}$$

(f) 70 ÷ 4 = 17 R 2
$$\begin{array}{r} 17\ \text{R}\ 2 \\ 4\overline{)70} \\ 4 \\ \hline 30 \\ 28 \\ \hline 2 \end{array}$$

(g) 93 ÷ 4 = 23 R 1
$$\begin{array}{r} 23\ \text{R}\ 1 \\ 4\overline{)93} \\ 8 \\ \hline 13 \\ 12 \\ \hline 1 \end{array}$$

(h) 92 ÷ 7 = 13 R 1
$$\begin{array}{r} 13\ \text{R}\ 1 \\ 7\overline{)92} \\ 7 \\ \hline 22 \\ 21 \\ \hline 1 \end{array}$$

(i) 87 ÷ 6 = 14 R 3
$$\begin{array}{r} 14\ \text{R}\ 3 \\ 6\overline{)87} \\ 6 \\ \hline 27 \\ 24 \\ \hline 3 \end{array}$$

(j) 77 ÷ 4 = 19 R 1
$$\begin{array}{r} 19\ \text{R}\ 1 \\ 4\overline{)77} \\ 4 \\ \hline 37 \\ 36 \\ \hline 1 \end{array}$$

4. Multiply the quotient 12 by 7.
12 × 7 = 84
Then add the remainder 4 to check the answer.
84 + 4 = 88
88 does not match the 90 given in the question. So, Matthew's answer is incorrect.
$$\begin{array}{r} 12\ \text{R}\ 6 \\ 7\overline{)90} \\ 7 \\ \hline 20 \\ 14 \\ \hline 6 \end{array}$$
90 ÷ 7 = 12 R 6
The remainder should be 6.

Exercise 3K Divide a 3-Digit or a 4-Digit Number by a 1-Digit Number (1)

1. 200 ÷ 4 = 2 hundreds ÷ 4
= 20 tens ÷ 4
= 5 tens
= 50

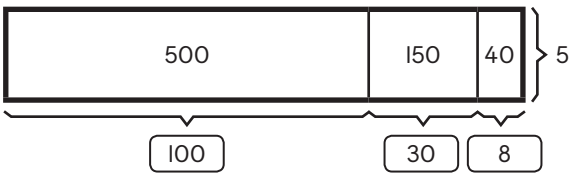
2. **(a)** 400 ÷ 2 = 200

(b) 900 ÷ 3 = 300

(c) 300 ÷ 5 = 60

(d) 400 ÷ 8 = 50

3. 690 ÷ 5 = 138



690 ÷ 5 = 100 + 30 + 8
= 138

4. **(a)** 875 ÷ 7 = 125

```
   1 2 5
7 ) 8 7 5
    7
    1 7
    1 4
      3 5
      3 5
        0
```

(b) 257 ÷ 3 = 85 R 2

```
     8 5 R 2
3 ) 2 5 7
    2 4
      1 7
      1 5
        2
```

(c) 339 ÷ 4 = 84 R 3

```
     8 4 R 3
4 ) 3 3 9
    3 2
      1 9
      1 6
        3
```

(d) 739 ÷ 5 = 147 R 3

```
     1 4 7 R 4
5 ) 7 3 9
    5
    2 3
    2 0
      3 9
      3 5
        4
```

(e) 474 ÷ 6 = 79

```
     7 9
6 ) 4 7 4
    4 2
      5 4
      5 4
        0
```

(f) 537 ÷ 2 = 268 R 1

```
     2 6 8 R 1
2 ) 5 3 7
    4
    1 3
    1 2
      1 7
      1 6
        1
```

(g) 996 ÷ 8 = 124 R 4

```
     1 2 4 R 4
8 ) 9 9 6
    8
    1 9
    1 6
      3 6
      3 2
        4
```

(h) 805 ÷ 6 = 134 R 1

```
     1 3 4 R 1
6 ) 8 0 5
    6
    2 0
    1 8
      2 5
      2 4
        1
```

Exercise 3K Divide a 3-Digit or a 4-Digit Number by a 1-Digit Number (2)

1. 3,000 ÷ 5 = 3 thousands ÷ 5
= 30 hundreds ÷ 5
= 6 hundreds
= 600

2. **(a)** 6,000 ÷ 2 = 3,000

(b) 4,000 ÷ 8 = 500

3. **(a)** 4,170 ÷ 5 = 834

```
     8 3 4
5 ) 4 1 7 0
    4 0
      1 7
      1 5
        2 0
        2 0
          0
```

(b) 7,589 ÷ 3 = 2,529 R 2

```
     2 5 2 9 R 2
3 ) 7 5 8 9
    6
    1 5
    1 5
      8
      6
      2 9
      2 7
        2
```

4. **(a)** 4,428 ÷ 6 = 738

```
      7  3  8
   ------------
6 ) 4  4  2  8
    4  2
   ------------
       2  2
       1  8
   ------------
          4  8
          4  8
   ------------
             0
```

(b) 5,067 ÷ 9 = 563

```
      5  6  3
   ------------
9 ) 5  0  6  7
    4  5
   ------------
       5  6
       5  4
   ------------
          2  7
          2  7
   ------------
             0
```

(c) 7,459 ÷ 4 = 1,864 R 3

```
      1  8  6  4  R 3
   ------------------
4 ) 7  4  5  9
    4
   ------------
    3  4
    3  2
   ------------
       2  5
       2  4
   ------------
          1  9
          1  6
   ------------
             3
```

(d) 9,194 ÷ 5 = 1,838 R 4

```
      1  8  3  8  R 4
   ------------------
5 ) 9  1  9  4
    5
   ------------
    4  1
    4  0
   ------------
       1  9
       1  5
   ------------
          4  4
          4  0
   ------------
             4
```

5. No, I do not agree.
5,000 ÷ 5 = 1,000
So, when 5,160 is divided by 5, the quotient should be more than 1,000, not just 132.

```
      1  0  3  2
   ------------
5 ) 5  1  6  0
    5
   ------------
       1
       0
   ------------
       1  6
       1  5
   ------------
          1  0
          1  0
   ------------
             0
```

The quotient is 1,032.

Exercise 3L Estimate Quotients

1. 94 ÷ 8 → 88 ÷ 8 = 11; 96 ÷ 8 = 12

94 is nearer to 96 than to 88.
96 ÷ 8 = 12
The value of 94 ÷ 8 is about 12.

2. 580 ÷ 6 → 540 ÷ 6 = 90; 600 ÷ 6 = 100

580 is nearer to 600 than to 540.
600 ÷ 6 = 100
The value of 580 ÷ 6 is about 100.

3. 3,999 ÷ 7 → 3,500 ÷ 7 = 500; 4,200 ÷ 7 = 600

3,999 is nearer to 4,200 than to 3,500.
4,200 ÷ 7 = 600
The value of 3,999 ÷ 7 is about 600.

4. 3,980 ÷ 9 → 3,600 ÷ 9 = 400; 4,500 ÷ 9 = 500

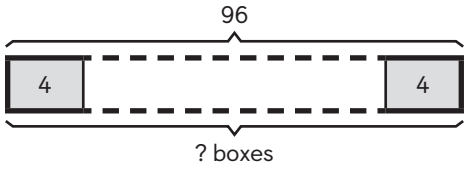
3,980 is nearer to 3,600 than to 4,500.
3,600 ÷ 9 = 400
The value of 3,980 ÷ 9 is about 400.

5. 596 ÷ 8 = 74 R 4
The actual value is 74 R 4. Arden's estimated quotient is not reasonable.

596 is nearer to 560 than to 640.
560 ÷ 8 = 70
The value of 596 ÷ 8 is about 70.
A better estimate is 70.

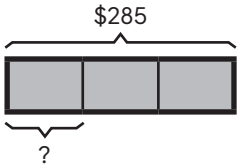
Exercise 3M Word Problems (1)

1.



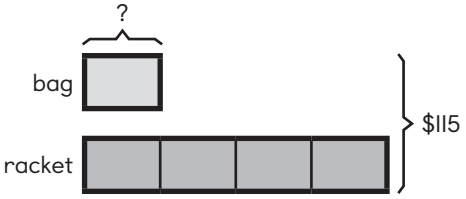
96 ÷ 4 = 24
24 boxes were used altogether.

2.



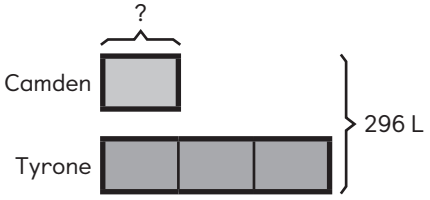
285 ÷ 3 = 95
Each charity home will get $95.

3.



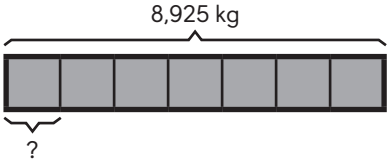
115 ÷ 5 = 23
Lydia paid $23 for the bag.

4.



296 ÷ 4 = 74
Camden pumped 74 liters of gas into his truck.

5.

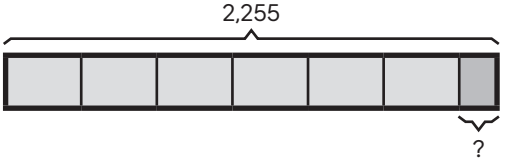


8,925 ÷ 7 = 1,275
There are 1,275 kilograms of cargo in each storage container.

6.

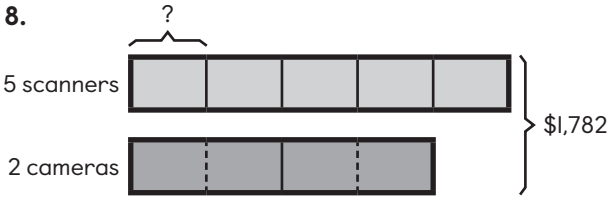
2,920 ÷ 8 = 365
There are 365 pears.

7.



2,255 ÷ 6 = 375 R 5
There were 5 loose collar pins left.

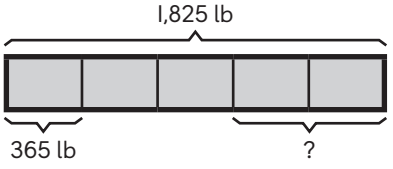
8.



1,782 ÷ 9 = 198
The cost of a scanner is $198.

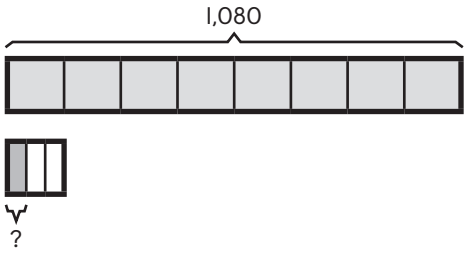
Exercise 3M Word Problems (2)

1.



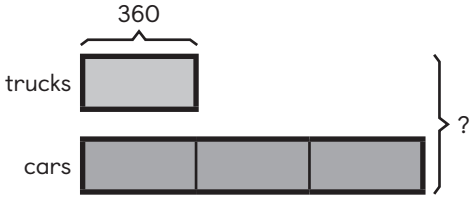
1,825 ÷ 5 = 365
The farmer used 365 pounds of fertilizer each month.
365 × 2 = 730
The farmer used 730 pounds of fertilizer in 2 months.

2.

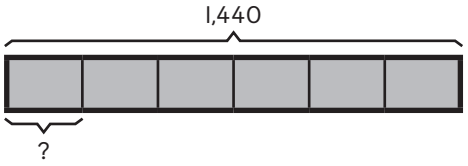


1,080 ÷ 8 = 135
There were 135 chairs in each room.
135 ÷ 3 = 45
There were 45 chairs in each row.

3.

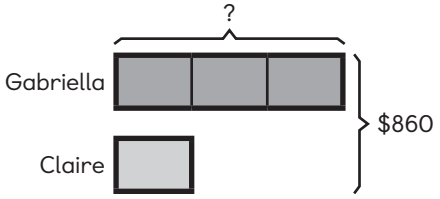


1 unit = 360
4 units = 4 × 360
= 1,440



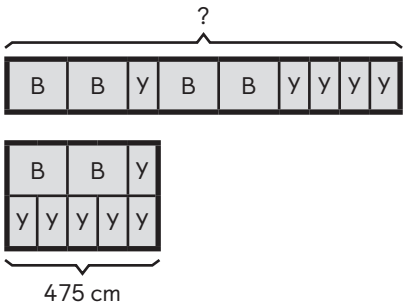
1,440 ÷ 6 = 240
240 toys were delivered to each shop.

4.



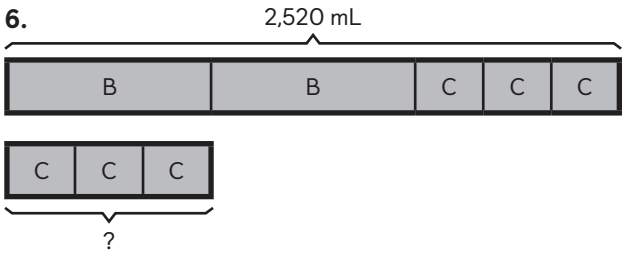
4 units = $860
1 unit = 860 ÷ 4
= $215
3 units = 3 × 215
= $645
Gabriella saved $645.

5.



The length of 5 such yellow banners is 475 centimeters.
475 ÷ 5 = 95
The length of 1 yellow banner is 95 centimeters.
95 × 13 = 1,235
The total length of 4 such blue banners and 5 such yellow banners is 1,235 centimeters.

6.



The capacity of 9 cups is 2,520 milliliters.
2,520 ÷ 9 = 280
The capacity of 1 cup is 280 milliliters.
280 × 3 = 840
The capacity of each bottle is 840 milliliters.

Chapter Practice

1. C

2. B

3. C

4. D

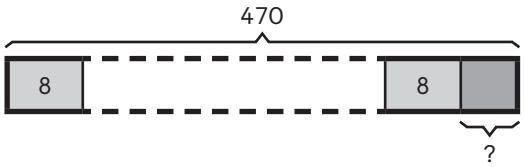
5. B, D

6. 3,293

7. 239

8. Factors of 12 are: 1, 2, 3, 4, 6, 12
Add 5 to each factor: 6, 7, 8, 9, 11, 17
8 is a multiple of 4.
Hence, the number is 3.

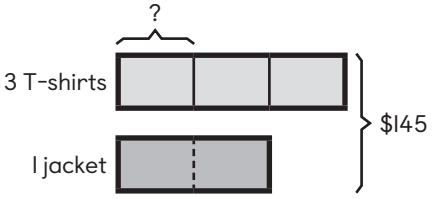
9.



470 ÷ 8 = 58 R 6
6 beads are left.

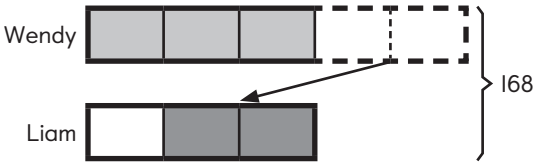
10. Multiple of 6: 6, 12, **18**, 24, 30, **36**, 42, 48, **54**, 60
Multiple of 9: 8, **18**, 27, **36**, 45, **54**, 63
Common Multiples: 18, 36, 54
They will blink at the same moment thrice in the span of 1 minute.

11.



145 ÷ 5 = 29
Steve paid $29 for a T-shirt.

12.



168 ÷ 6 = 28
28 × 2 = 56
Wendy should give Liam 56 colored pencils.

13. 445 ÷ 7 = 63 R 4
The actual value is 63 R 4. Matthew's estimated quotient is not reasonable.

445 ÷ 7 → 420 ÷ 7 = 60
445 ÷ 7 → 490 ÷ 7 = 70

445 is nearer to 420 than to 490.
420 ÷ 7 = 60
The value of 445 ÷ 7 is about 60.
A better estimate is 60.

14. List all the factors of 36 and 60.

36	60
1 × 36	1 × 60
2 × 18	2 × 30
3 × 12	3 × 20
4 × 9	4 × 15
6 × 6	5 × 12
	6 × 10

The factors of 36 are **1**, **2**, **3**, **4**, **6**, 9, **12**, 18, and 36.
The factors of 60 are **1**, **2**, **3**, **4**, 5, **6**, 10, **12**, 15, 20, 30, and 60.
The common factors of 36 and 60 are 1, 2, 3, 4, 6, and 12.
Since 9 is not a common factor of 36 and 60, she cannot cut a length of 9 centimeters.
The greatest common factor is 12.
The longest possible length Angeline can cut is 12 centimeters.

15. List the multiples of 6 and 8 using a table.

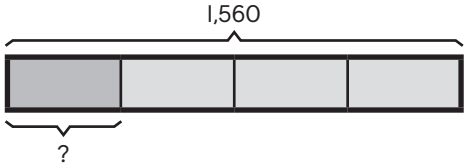
Number of children	1	2	3	4
Multiples of 6	6	12	18	24
	+ 5	+ 5	+ 5	+ 5
Total number of pencils	11	17	23	29
Multiples of 8	8	16	24	32
	− 3	− 3	− 3	− 3
Total number of pencils	5	13	21	29

The least possible number of pencils Mr. Dave buys is 29.
He has 4 children.

Chapter 4 THE FOUR OPERATIONS USING BAR MODELS

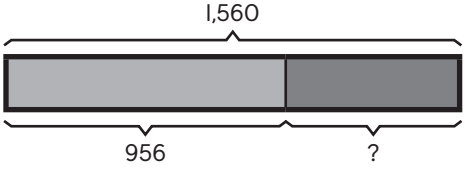
Exercise 4A Word Problems (I)

1. (a)



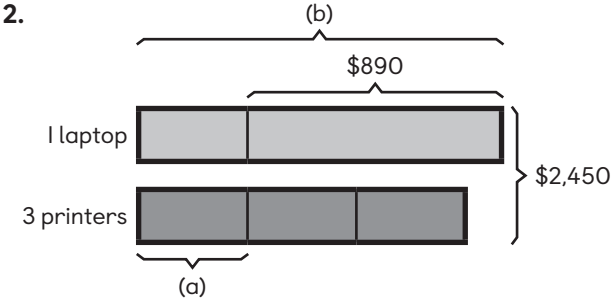
4 units = 1,560
1 unit = 1,560 ÷ 4
= 390
There were 390 fiction books.

(b)



1,560 − 956 = 604
604 books were left.

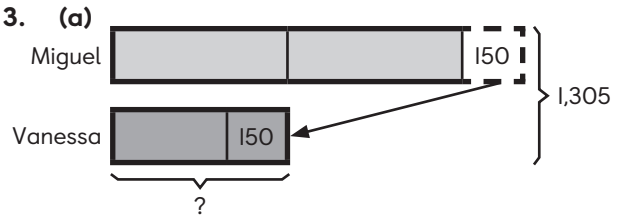
2.



(a) 4 units = 2,450 − 890
= $1,560
1 unit = 1,560 ÷ 4
= $390
Lisa paid $390 for each printer.

(b) 390 + 890 = 1,280
Lisa paid $1,280 for the laptop.

3. (a)

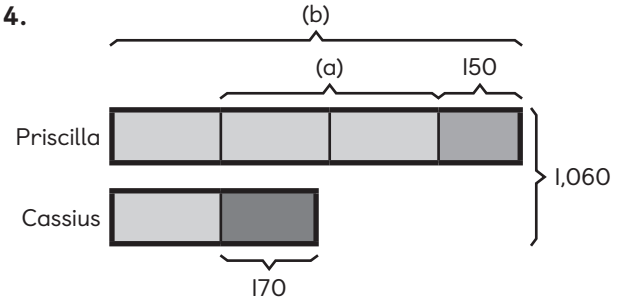


1,305 ÷ 3 = 435
Vanessa had 435 building blocks in the end.

(b) 435 × 2 = 870
Miguel had 870 building blocks in the end.

870 + 150 = 1,020
Miguel had 1,020 building blocks at first.

4.

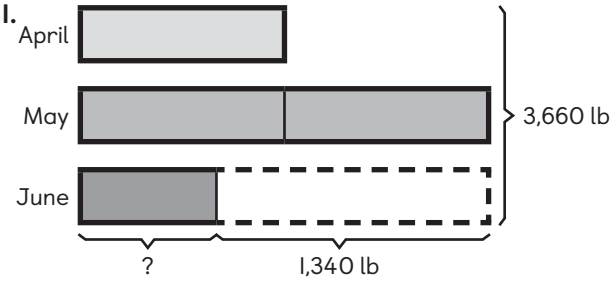


(a) 4 units = 1,060 − 150 − 170
= 740
1 unit = 740 ÷ 4
= 185
2 units = 2 × 185
= 370
Priscilla had 370 more game points than Cassius in the end.

(b) 185 × 3 = 555
Priscilla had 555 game points in the end.
555 + 150 = 705
Priscilla had 705 game points at first.

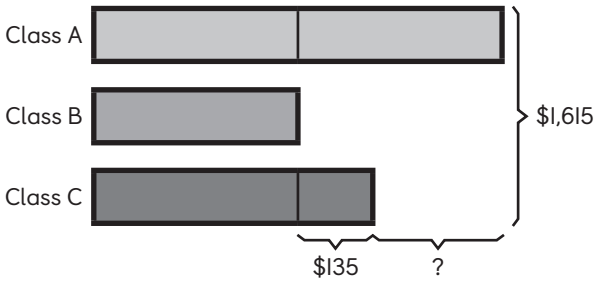
Exercise 4A Word Problems (2)

1.



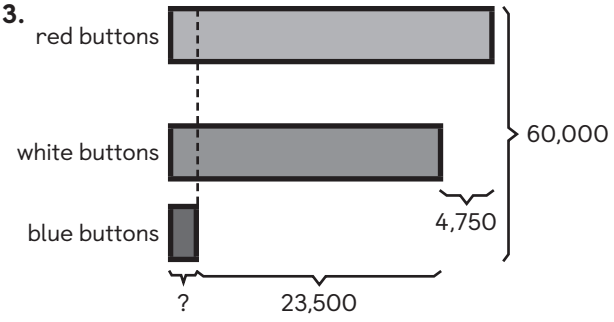
5 units = 3,660 + 1,340
= 5,000 lb
1 unit = 5,000 ÷ 5
= 1,000 lb
2 units = 2 × 1,000
= 2,000 lb
2,000 − 1,340 = 660
The farm produced 660 pounds of vegetables in June.

2.



4 units = 1,615 − 135
= $1,480
1 unit = 1,480 ÷ 4
= $370
370 − 135 = 235
Class A raised $235 more than Class C.

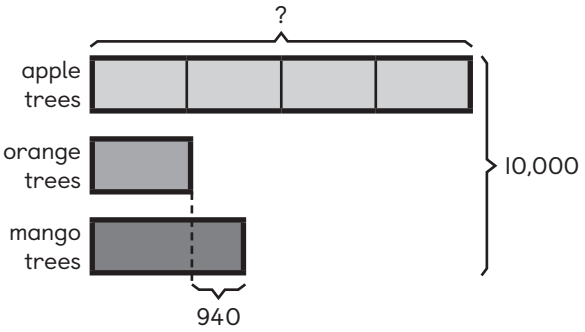
3.



23,500 + 4,750 = 28,250
28,250 more red buttons than blue buttons were produced.

3 units = 60,000 − 28,250 − 23,500
= 8,250
1 unit = 8,250 ÷ 3
= 2,750
The factory produced 2,750 blue buttons.

4.



6 units = 10,000 − 940
= 9,060
1 unit = 9,060 ÷ 6
= 1,510
4 units = 4 × 1,510
= 6,040
There are 6,040 apple trees.

Chapter Practice

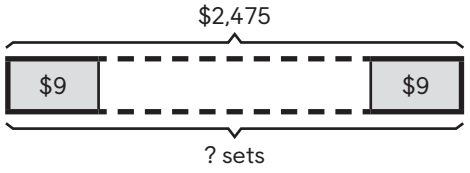
1. B

2. C

3. B

4. A

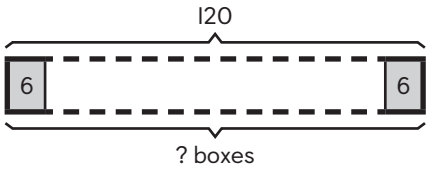
5. **(a)** 5 + 2 + 2 = 9
1 adult ticket and 2 child tickets cost $9 altogether.



2,475 ÷ 9 = 275
There were 275 adults at the concert.

(b) 275 × 2 = 550
There were 550 children at the concert.

6. (a)

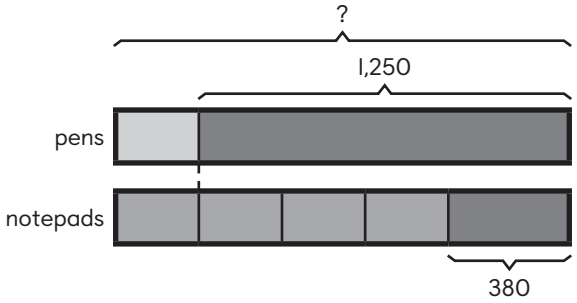


120 ÷ 6 = 20
There were 20 boxes altogether.
20 − 3 = 17
The baker sold 17 boxes at $18 each.
18 ÷ 2 = 9
The baker sold the remaining 3 boxes at $9 each.

18 × 17 = 306
The baker collected $306 from the sale of the first 17 boxes.
9 × 3 = 27
The baker collected $27 from the sale of the remaining 3 boxes.
306 + 27 = 333
The total amount of money collected from the sale of the cupcakes was $333.

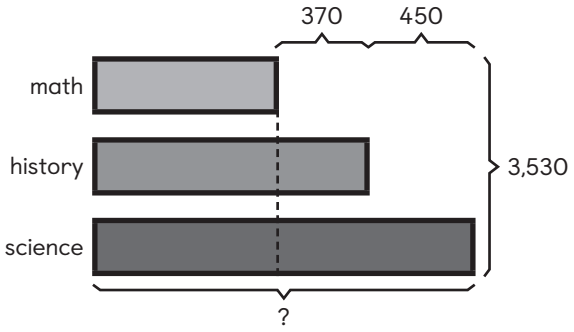
(b) Accept all correct explanations. Example:
The baker did not want to keep the cupcakes overnight.

7.



3 units = 1,250 − 380
= 870
1 unit = 870 ÷ 3
= 290
There were 290 pens left.
290 + 1,250 = 1,540
The stationery shop had 1,540 pens at first.

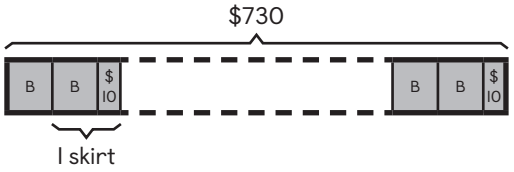
8.



370 + 450 = 820
There are 820 more science books than math books.

3 units = 3,530 − 820 − 370
= 2,340
1 unit = 2,340 ÷ 3
= 780
There are 780 math books.
780 + 820 = 1,600
There are 1,600 science books.

9. Assume Rebecca ordered 30 blouses.



20 × 30 = 600
730 − 600 = 130
The difference between the cost of 30 blouses and the actual amount spent was $130.
30 − 20 = 10
The difference in cost between a blouse and a skirt was $10.
130 ÷ 10 = 13
Rebecca ordered 13 skirts.
30 − 13 = 17
Rebecca ordered 17 blouses.

Alternative solution:
By guess and check:

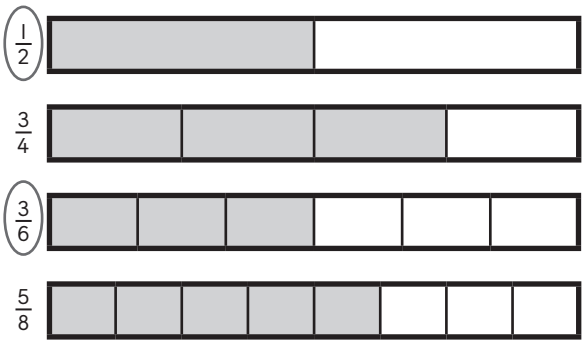
Cost of the Blouses	Cost of the Skirts	Total Spent	
15 × 20 = 300	15 × 30 = 450	300 + 450 = 750	✗
16 × 20 = 320	14 × 30 = 420	320 + 420 = 740	✗
17 × 20 = 340	13 × 30 = 390	340 + 390 = 730	✔

Rebecca ordered 17 blouses.

Chapter 5 FRACTIONS

Exercise 5A Equivalent Fractions (I)

1.



2. **(a)** $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{6}{12}$

(b) $\frac{3}{4} = \frac{9}{12}$

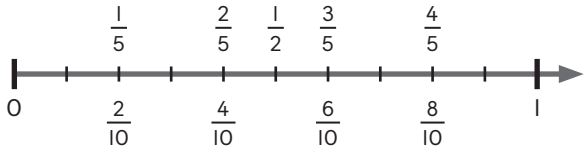
(c) $\frac{5}{6} = \frac{10}{12}$

(d) $\frac{2}{2} = \frac{4}{4} = \frac{6}{6} = \frac{12}{12}$

3. **(a)** $\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{5}{15}$

(b) $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{10}{15}$

4.



(a) $\frac{5}{10}$ **(b)** $\frac{2}{10}$

(c) $\frac{6}{10}$ **(d)** $\frac{2}{5}$

Exercise 5A Equivalent Fractions (2)

1. **(a)** $\frac{3}{4} \overset{\times 3}{=} \frac{9}{12} \overset{\times 5}{=} \frac{15}{20}$

$\frac{3}{4} = \frac{9}{12} = \frac{15}{20}$

(b) $\frac{4}{7} \overset{\times 2}{=} \frac{8}{14} \overset{\times 4}{=} \frac{16}{28}$

$\frac{4}{7} = \frac{8}{14} = \frac{16}{28}$

(c) $\frac{5}{9} \overset{\times 3}{=} \frac{15}{27} \overset{\times 5}{=} \frac{25}{45}$

$\frac{5}{9} = \frac{15}{27} = \frac{25}{45}$

(d) $\frac{2}{3} \overset{\times 4}{=} \frac{8}{12} \overset{\times 5}{=} \frac{10}{15}$

$\frac{2}{3} = \frac{8}{12} = \frac{10}{15}$

(e) $\frac{5}{6} \overset{\times 3}{=} \frac{15}{18} \overset{\times 6}{=} \frac{30}{36}$

$\frac{5}{6} = \frac{15}{18} = \frac{30}{36}$

2. **(a)** $\frac{4}{5} = \boxed{\frac{20}{25}} = \boxed{\frac{24}{30}}$

(b) $\frac{1}{2} = \boxed{\frac{7}{14}} = \boxed{\frac{10}{20}}$

(c) $\frac{3}{10} = \boxed{\frac{12}{40}} = \boxed{\frac{18}{60}}$

(d) $\frac{2}{5} = \boxed{\frac{12}{30}} = \boxed{\frac{18}{45}}$

(e) $\frac{6}{7} = \boxed{\frac{12}{14}} = \boxed{\frac{24}{28}}$

(f) $\frac{7}{8} = \boxed{\frac{21}{24}} = \boxed{\frac{35}{40}}$

(g) $\frac{7}{10} = \boxed{\frac{21}{30}} = \boxed{\frac{28}{40}}$

(h) $\frac{4}{9} = \boxed{\frac{12}{27}} = \boxed{\frac{20}{45}}$

(i) $\frac{5}{8} = \boxed{\frac{10}{16}} = \boxed{\frac{20}{32}}$

(j) $\frac{5}{12} = \boxed{\frac{15}{36}} = \boxed{\frac{20}{48}}$

Exercise 5A Equivalent Fractions (3)

1. **(a)** $\frac{1}{2}$ **(b)** $\frac{2}{3}$

(c) $\frac{2}{5}$ **(d)** $\frac{1}{4}$

(e) $\frac{4}{5}$ **(f)** $\frac{2}{5}$

(g) $\frac{1}{3}$ **(h)** $\frac{5}{9}$

(i) $\frac{2}{3}$ **(j)** $\frac{3}{5}$

2. **(a)** $\frac{1}{4}$ **(b)** $\frac{3}{4}$

(c) $\frac{5}{9}$ **(d)** $\frac{6}{7}$

(e) $\frac{2}{5}$ **(f)** $\frac{4}{7}$

(g) $\frac{5}{12}$ **(h)** $\frac{4}{9}$

(i) $\frac{3}{4}$ **(j)** $\frac{3}{10}$

3. No, I do not agree with Jake.

Accept all correct explanations. Example: Although his answer of $\frac{12}{24}$ is a simpler form of $\frac{24}{48}$, it is not the simplest form as $\frac{12}{24}$ can still be simplified further. The simplest form of $\frac{24}{48}$ is $\frac{1}{2}$ after dividing the numerator and denominator by 12.

Exercise 5B Compare and Order Fractions (I)

1. **(a)** $\frac{1}{4} \xrightarrow{\times 5} \boxed{\frac{5}{20}}$ $\frac{5}{6}$

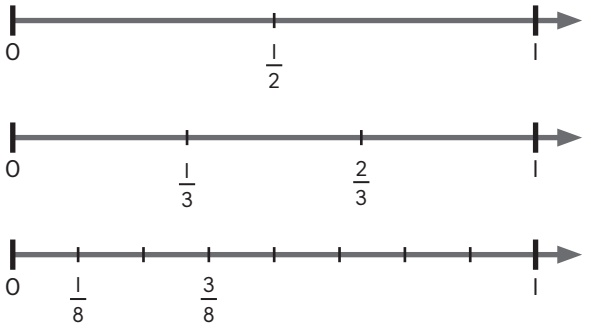
$\frac{1}{4}$ is less than $\frac{5}{6}$.

(b) $\frac{4}{5} \xrightarrow{\times 9} \boxed{\frac{36}{45}}$ $\frac{8}{9} \xrightarrow{\times 5} \boxed{\frac{40}{45}}$

$\frac{8}{9}$ is greater than $\frac{4}{5}$.

2. $\frac{2}{5} < \frac{5}{6}$

3.



$\frac{2}{3} > \frac{3}{8}$

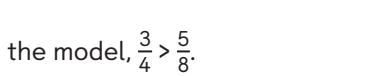
4. **(a)** $\frac{4}{5}$ $\frac{7}{10}$ **(b)** $\frac{7}{18}$ $\frac{4}{9}$

(c) $\frac{6}{14}$ $\frac{5}{7}$ **(d)** $\frac{2}{3}$ $\frac{5}{12}$

5. I do not agree with Logan.
Accept all correct explanations. Example:
When comparing fractions, we are comparing the number of parts out of the same whole.
We can represent the two fractions as shown:

$\frac{5}{8}$

$\frac{3}{4} = \frac{6}{8}$



From the model, $\frac{3}{4} > \frac{5}{8}$.

Exercise 5B Compare and Order Fractions (2)

1. $\underset{\text{least}}{\frac{2}{5}}$, $\frac{1}{2}$, $\underset{\text{greatest}}{\frac{3}{4}}$

2. $\underset{\text{greatest}}{\frac{5}{6}}$, $\frac{3}{4}$, $\underset{\text{least}}{\frac{2}{3}}$

3. $\frac{7}{10} = \frac{14}{20}$ $\frac{2}{5} = \frac{8}{20}$ $\frac{3}{4} = \frac{15}{20}$

$\underset{\text{least}}{\frac{2}{5}}$, $\frac{7}{10}$, $\underset{\text{greatest}}{\frac{3}{4}}$

4. $\frac{5}{9} = \frac{10}{18}$ $\frac{2}{3} = \frac{12}{18}$

$\underset{\text{greatest}}{\frac{13}{18}}$, $\frac{2}{3}$, $\underset{\text{least}}{\frac{5}{9}}$

5. $\frac{5}{6} = \frac{10}{12}$ $\frac{1}{2} = \frac{6}{12}$ $\frac{2}{3} = \frac{8}{12}$ $\frac{3}{4} = \frac{9}{12}$

$\frac{2}{3}$ is greater than $\frac{7}{12}$ but less than $\frac{3}{4}$.

6. Gary Joel Cynthia

$\frac{2}{6} = \frac{8}{24}$ $\frac{3}{8} = \frac{9}{24}$ $\frac{3}{12} = \frac{6}{24}$

$\frac{9}{24}$ is greater than $\frac{8}{24}$ and $\frac{6}{24}$.

Joel ate the most.

Exercise 5C Add and Subtract Like Fractions (1)

1. **(a)** $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

(b) $\frac{2}{9} + \frac{5}{9} = \frac{7}{9}$

(c) $\frac{4}{10} + \frac{5}{10} = \frac{9}{10}$

2. **(a)** $\frac{4}{10} + \frac{1}{10} = \frac{5}{10}$
$= \frac{1}{2}$

(b) $\frac{3}{12} + \frac{5}{12} = \frac{8}{12}$
$= \frac{2}{3}$

(c) $\frac{1}{8} + \frac{3}{8} = \frac{4}{8}$
$= \frac{1}{2}$

(d) $\frac{2}{12} + \frac{7}{12} = \frac{9}{12}$
$= \frac{3}{4}$

(e) $\frac{4}{14} + \frac{6}{14} = \frac{10}{14}$
$= \frac{5}{7}$

(f) $\frac{7}{15} + \frac{3}{15} = \frac{10}{15}$
$= \frac{2}{3}$

(g) $\frac{7}{16} + \frac{5}{16} = \frac{12}{16}$
$= \frac{3}{4}$

(h) $\frac{1}{18} + \frac{5}{18} = \frac{6}{18}$
$= \frac{1}{3}$

(i) $\frac{7}{18} + \frac{3}{18} + \frac{5}{18} = \frac{15}{18}$
$= \frac{5}{6}$

(j) $\frac{3}{20} + \frac{9}{20} + \frac{6}{20} = \frac{18}{20}$
$= \frac{9}{10}$

(k) $\frac{5}{24} + \frac{7}{24} + \frac{9}{24} = \frac{21}{24}$
$= \frac{7}{8}$

(l) $\frac{2}{9} + \frac{2}{9} + \frac{5}{9} = \frac{9}{9}$
$= 1$

Exercise 5C Add and Subtract Like Fractions (2)

1. **(a)** $\frac{6}{9} - \frac{2}{9} = \frac{4}{9}$

(b) $\frac{7}{12} - \frac{2}{12} = \frac{5}{12}$

(c) $\frac{9}{10} - \frac{4}{10} = \frac{5}{10}$
$= \frac{1}{2}$

2. **(a)** $\frac{11}{14} - \frac{4}{14} = \frac{7}{14}$

$= \frac{1}{2}$

(b) $\frac{11}{12} - \frac{2}{12} = \frac{9}{12}$

$= \frac{3}{4}$

(c) $\frac{11}{16} - \frac{7}{16} = \frac{4}{16}$

$= \frac{1}{4}$

(d) $\frac{11}{18} - \frac{5}{18} = \frac{6}{18}$

$= \frac{1}{3}$

(e) $1 - \frac{9}{18} = \frac{9}{18}$

$= \frac{1}{2}$

(f) $1 - \frac{8}{20} = \frac{12}{20}$

$= \frac{3}{5}$

3. $\frac{11}{12} - \frac{9}{12} = \frac{2}{12}$

$= \frac{1}{6}$

$\frac{3}{6} + \frac{1}{6} = \frac{4}{6}$

$= \frac{2}{3}$

The answer is $\frac{2}{3}$.

4. $\frac{7}{10} - \frac{1}{10} = \frac{6}{10}$

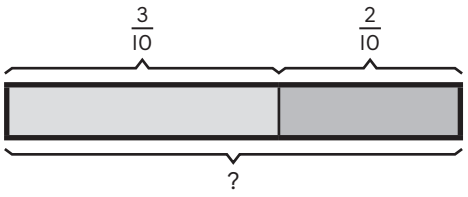
$1 - \frac{6}{10} = \frac{4}{10}$

$= \frac{2}{5}$

The fraction is $\frac{2}{5}$.

Exercise 5D Word Problems (1)

1.

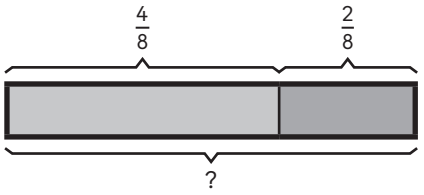


$\frac{3}{10} + \frac{2}{10} = \frac{5}{10}$

$= \frac{1}{2}$

$\frac{1}{2}$ of the chicken pie was eaten.

2.

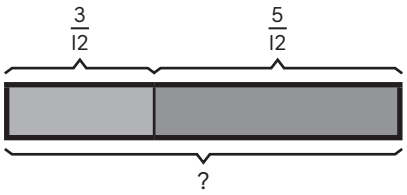


$\frac{4}{8} + \frac{2}{8} = \frac{6}{8}$

$= \frac{3}{4}$

$\frac{3}{4}$ of the ribbon was used.

3.

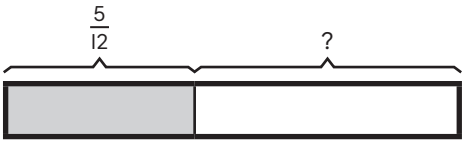


$\frac{3}{12} + \frac{5}{12} = \frac{8}{12}$

$= \frac{2}{3}$

$\frac{2}{3}$ of the wall is painted.

4.

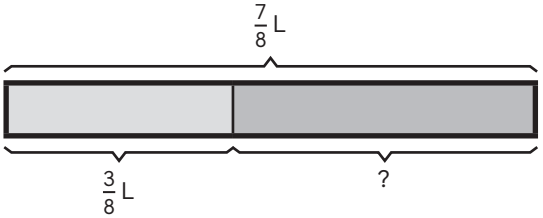


$1 - \frac{5}{12} = \frac{12}{12} - \frac{5}{12}$

$= \frac{7}{12}$

$\frac{7}{12}$ of the cake was left.

5.

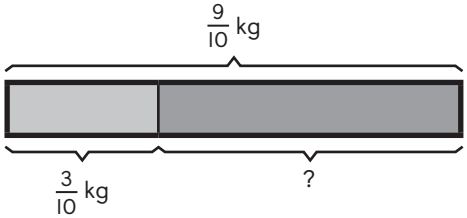


$\frac{7}{8} - \frac{3}{8} = \frac{4}{7}$

$= \frac{1}{2}$

$\frac{1}{2}$ liter of orange juice is left.

6.



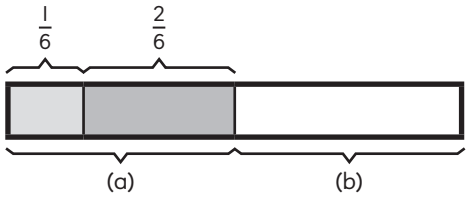
$\frac{9}{10} - \frac{3}{10} = \frac{6}{10}$

$= \frac{3}{5}$

$\frac{3}{5}$ kilogram of beef was left.

Exercise 5D Word Problems (2)

1.



(a) $\frac{1}{6} + \frac{2}{6} = \frac{3}{6}$

$= \frac{1}{2}$

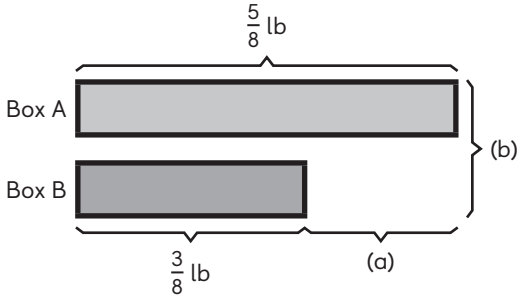
$\frac{1}{2}$ of the watermelon was eaten.

(b) $1 - \frac{1}{2} = \frac{2}{2} - \frac{1}{2}$

$= \frac{1}{2}$

$\frac{1}{2}$ of the watermelon was left.

2.



(a) $\frac{5}{8} - \frac{3}{8} = \frac{2}{8}$

$= \frac{1}{4}$

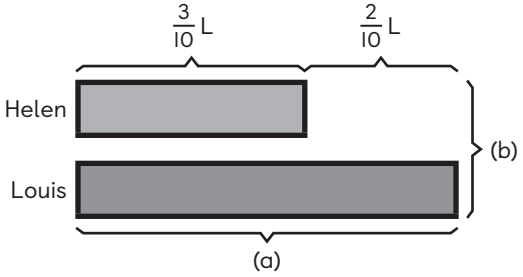
Box A has $\frac{1}{4}$ pound more sand than Box B.

(b) $\frac{5}{8} + \frac{3}{8} = \frac{8}{8}$

$= 1$

There is 1 pound of sand in both boxes altogether.

3.



(a) $\frac{3}{10} + \frac{2}{10} = \frac{5}{10}$

$= \frac{1}{2}$

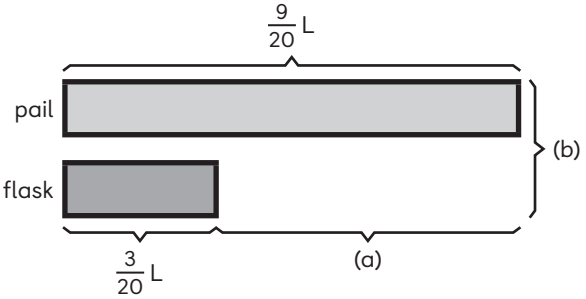
Louis drank $\frac{1}{2}$ liter of mango juice.

(b) $\frac{3}{10} + \frac{5}{10} = \frac{8}{10}$

$= \frac{4}{5}$

Helen and Louis drank $\frac{4}{5}$ liter of mango juice altogether.

4.



(a) $\frac{9}{20} - \frac{3}{20} = \frac{6}{20}$

$= \frac{3}{10}$

There is $\frac{3}{10}$ liter more water in the pail than the flask.

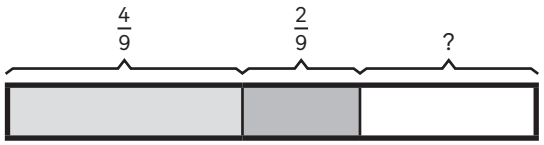
(b) $\frac{9}{20} + \frac{3}{20} = \frac{12}{20}$

$= \frac{3}{5}$

There is $\frac{3}{5}$ liter of water in the pail and flask altogether.

Exercise 5D Word Problems (3)

1.



$\frac{4}{9} + \frac{2}{9} = \frac{6}{9}$

$\frac{6}{9}$ of the pole is painted red and blue.

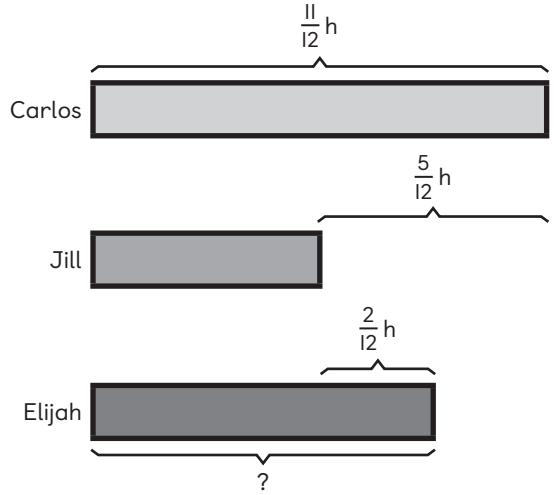
$1 - \frac{6}{9} = \frac{9}{9} - \frac{6}{9}$

$= \frac{3}{9}$

$= \frac{1}{3}$

$\frac{1}{3}$ of the pole is painted yellow.

2.



$\frac{11}{12} - \frac{5}{12} = \frac{6}{12}$

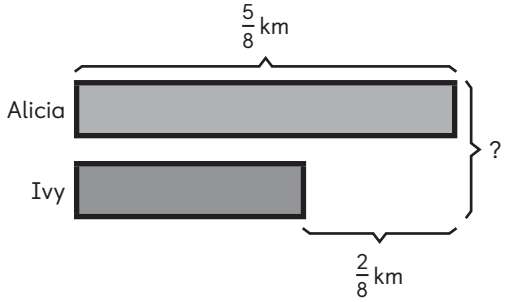
Jill spends $\frac{6}{12}$ hour on reading.

$\frac{6}{12} + \frac{2}{12} = \frac{8}{12}$

$= \frac{2}{3}$

Elijah spends $\frac{2}{3}$ hour on reading.

3.



$\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$

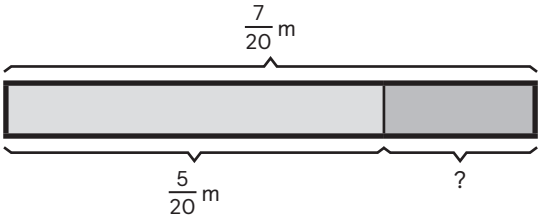
Ivy jogs $\frac{3}{8}$ kilometer.

$\frac{5}{8} + \frac{3}{8} = \frac{8}{8}$

$= 1$

Alicia and Ivy jog 1 kilometer altogether.

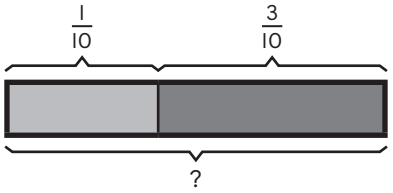
4.



$\frac{7}{20} - \frac{5}{20} = \frac{2}{20}$

$= \frac{1}{10}$

By Tuesday, Megan had $\frac{1}{10}$ meter of ribbon left.



$\frac{1}{10} + \frac{3}{10} = \frac{4}{10}$

$= \frac{2}{5}$

Megan had $\frac{2}{5}$ meter of ribbon in the end.

Chapter Practice

1. B

2. D

3. B

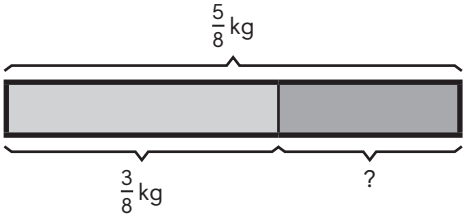
4. C

5. A

6. D

7. B, C

8.

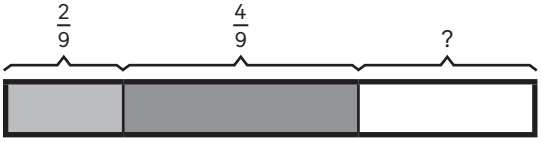


$\frac{5}{8} - \frac{3}{8} = \frac{2}{8}$

$= \frac{1}{4}$

Anne used $\frac{1}{4}$ kilogram of sugar.

9.



$\frac{2}{9} + \frac{4}{9} = \frac{6}{9}$

$= \frac{2}{3}$

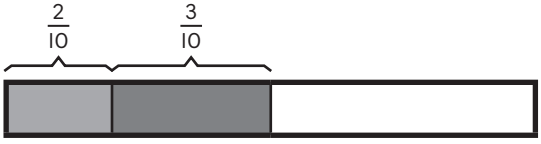
Sam spent $\frac{2}{3}$ of his money.

$1 - \frac{2}{3} = \frac{3}{3} - \frac{2}{3}$

$= \frac{1}{3}$

Sam had $\frac{1}{3}$ of his money left.

10. No, I do not agree with Helen.



$\frac{3}{10} + \frac{2}{10} = \frac{5}{10}$

$1 - \frac{5}{10} = \frac{5}{10}$

$= \frac{1}{2}$

Helen had $\frac{1}{2}$, not less than $\frac{1}{2}$ of the cake left.

11. Yes, I agree with Paten.
There is more than 1 possible pair.
Examples:

Pairs of Fractions	Sum	Difference
$\frac{3}{4}$ and $\frac{1}{4}$	$\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$ $= 1$	$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$ $= \frac{1}{2}$
$\frac{6}{8}$ and $\frac{2}{8}$	$\frac{6}{8} + \frac{2}{8} = \frac{8}{8}$ $= 1$	$\frac{6}{8} - \frac{2}{8} = \frac{4}{8}$ $= \frac{1}{2}$
$\frac{12}{16}$ and $\frac{4}{16}$	$\frac{12}{16} + \frac{4}{16} = \frac{16}{16}$ $= 1$	$\frac{12}{16} - \frac{4}{16} = \frac{8}{16}$ $= \frac{1}{2}$

Chapter 6 MIXED NUMBERS, IMPROPER FRACTIONS, AND OPERATIONS ON FRACTIONS

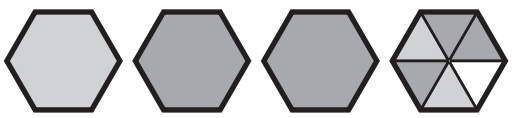
Exercise 6A Mixed Numbers and Improper Fractions (I)

1. **(a)** $4 + \frac{2}{3} = 4\frac{2}{3}$

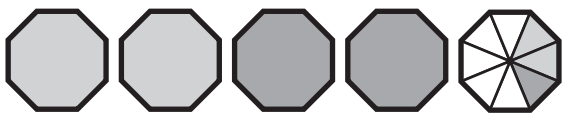
(b) $2 + \frac{6}{10} = 2\frac{6}{10}$

$= 2\frac{3}{5}$

2. **(a)**



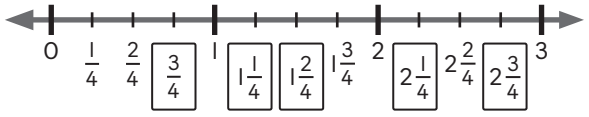
(b)



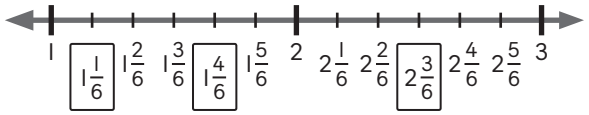
3. **(a)** $2\frac{5}{7}$ **(b)** $3\frac{7}{8}$

(c) $5\frac{4}{9}$ **(d)** $6\frac{7}{12}$

4. **(a)**



(b)



5. Paul's answer is correct.
He is adding 3 wholes and 10 out of 12 equal parts.

$3 + \frac{10}{12} = 3\frac{10}{12}$

$= 3\frac{5}{6}$

Paul's answer is correct. $3\frac{5}{6}$ is the simplified form of $3\frac{10}{12}$.

Exercise 6A Mixed Numbers and Improper Fractions (2)

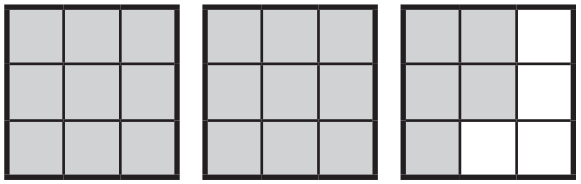
1. **(a)** 27 tenths = $\frac{27}{10}$

(b) 23 fifths = $\frac{23}{5}$

(c) 30 eighths = $\frac{30}{8}$

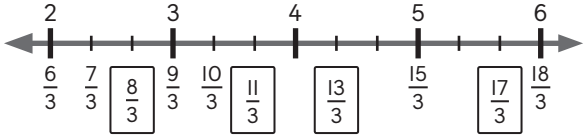
$= \frac{15}{4}$

2. **(a)**

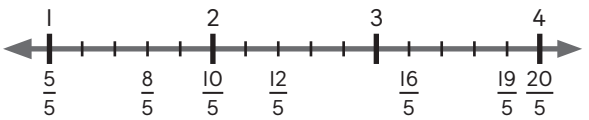


(b) 2 + $\frac{5}{9}$ = $2\frac{5}{9}$

3.



4.



5. **(a)** $\frac{14}{9}$ **(b)** $\frac{27}{4}$

(c) $\frac{15}{8}$ **(d)** $\frac{22}{7}$

Exercise 6A Mixed Numbers and Improper Fractions (3)

1. $\frac{11}{4} = \frac{8}{4} + \frac{3}{4}$

$= 2\frac{3}{4}$

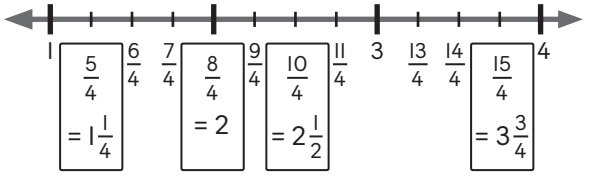
The mass of the packet of flour is $2\frac{3}{4}$ pounds.

2. $\frac{13}{6} = \frac{12}{6} + \frac{1}{6}$

$= 2\frac{1}{6}$

The length of the rope is $2\frac{1}{6}$ yards long.

3.



4. **(a)** $\frac{9}{4} = \frac{8}{4} + \frac{1}{4}$

$= 2 + \frac{1}{4}$

$= 2\frac{1}{4}$

(b) $\frac{10}{3} = \frac{9}{3} + \frac{1}{3}$

$= 3 + \frac{1}{3}$

$= 3\frac{1}{3}$

(c) $\frac{12}{5} = \frac{10}{5} + \frac{2}{5}$

$= 2 + \frac{2}{5}$

$= 2\frac{2}{5}$

(d) $\frac{25}{12} = \frac{24}{12} + \frac{1}{12}$

$= 2 + \frac{1}{12}$

$= 2\frac{1}{12}$

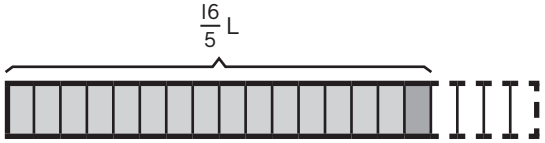
(e) $\frac{19}{6} = \frac{18}{6} + \frac{1}{6}$
$= 3 + \frac{1}{6}$
$= 3\frac{1}{6}$

(f) $\frac{16}{8} = 2$

(g) $\frac{29}{10} = \frac{20}{10} + \frac{9}{10}$
$= 2 + \frac{9}{10}$
$= 2\frac{9}{10}$

(h) $\frac{34}{9} = \frac{27}{9} + \frac{7}{9}$
$= 3 + \frac{7}{9}$
$= 3\frac{7}{9}$

5.

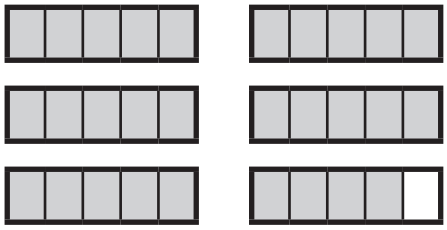


$\frac{16}{5} = \frac{15}{5} + \frac{1}{5}$
$= 3 + \frac{1}{5}$
$= 3\frac{1}{5}$

The volume of orange juice is $3\frac{1}{5}$ liters.

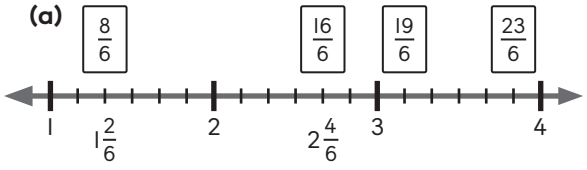
Exercise 6A Mixed Numbers and Improper Fractions (4)

1. **(a)**

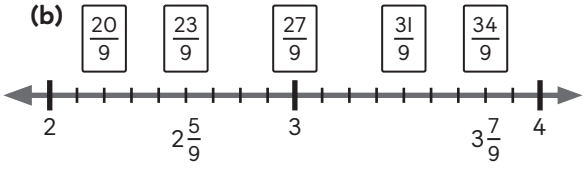


(b) $5\frac{4}{5} = 5 + \frac{4}{5}$
$= \frac{25}{5} + \frac{4}{5}$
$= \frac{29}{5}$

2. **(a)**



(b)



3. **(a)** $2\frac{2}{7} = 2 + \frac{2}{7}$
$= \frac{14}{7} + \frac{2}{7}$
$= \frac{16}{7}$

(b) $1\frac{5}{12} = 1 + \frac{5}{12}$
$= \frac{12}{12} + \frac{5}{12}$
$= \frac{17}{12}$

(c) $1\frac{7}{10} = 1 + \frac{7}{10}$
$= \frac{10}{10} + \frac{7}{10}$
$= \frac{17}{10}$

(d) $4 =$
Accept all correct answers. Examples: $\frac{12}{3}, \frac{16}{4}, \frac{20}{5}$

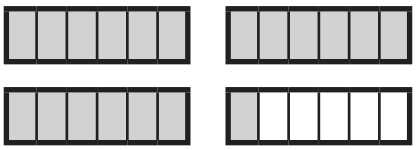
(e) $3\frac{5}{6} = 3 + \frac{5}{6}$
$= \frac{18}{6} + \frac{5}{6}$
$= \frac{23}{6}$

(f) $6 =$
Accept all correct answers. Examples: $\frac{12}{2}, \frac{18}{3}, \frac{24}{4}, \frac{30}{5}$

(g) $2\frac{3}{8} = 2 + \frac{3}{8}$
$= \frac{16}{8} + \frac{3}{8}$
$= \frac{19}{8}$

(h) $1\frac{4}{9} = 1 + \frac{4}{9}$
$= \frac{9}{9} + \frac{4}{9}$
$= \frac{13}{9}$

4. I disagree with Quinn.



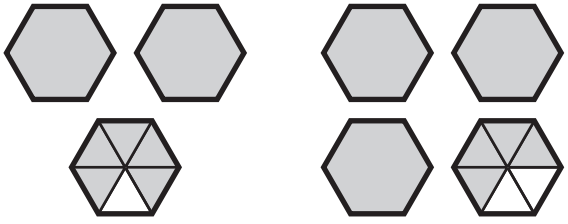
$3\frac{1}{6} = 3 + \frac{1}{6}$
$= \frac{18}{6} + \frac{1}{6}$
$= \frac{19}{6}$

The answer should be $\frac{19}{6}$.

Exercise 6B Add and Subtract Mixed Numbers (I)

1. $1\frac{2}{5} + 1\frac{4}{5} = 2\frac{6}{5}$
$= 3\frac{1}{5}$

2.



$2\frac{5}{6} + 3\frac{4}{6} = 5\frac{9}{6}$
$= 6\frac{3}{6}$
$= 6\frac{1}{2}$

3. **(a)**
$$\begin{array}{r} 3\frac{3}{4} \\ +\,5\frac{3}{4} \\ \hline 8\frac{6}{4} = 9\frac{2}{4} \\ = 9\frac{1}{2} \end{array}$$

(b)
$$\begin{array}{r} 2\frac{3}{10} \\ +\,4\frac{9}{10} \\ \hline 6\frac{12}{10} = 7\frac{2}{10} \\ = 7\frac{1}{5} \end{array}$$

4. **(a)** $2\frac{4}{9} + 1\frac{8}{9} = 3\frac{12}{9}$
$= 4\frac{3}{9}$
$= 4\frac{1}{3}$

(b) $3\frac{4}{6} + 2\frac{4}{6} = 5\frac{8}{6}$
$= 6\frac{2}{6}$
$= 6\frac{1}{3}$

(c) $4\frac{7}{10} + 1\frac{9}{10} = 5\frac{16}{10}$
$= 6\frac{6}{10}$
$= 6\frac{3}{5}$

(d) $5\frac{11}{12} + 2\frac{7}{12} = 7\frac{18}{12}$
$= 8\frac{6}{12}$
$= 8\frac{1}{2}$

(e) $2\frac{11}{18} + 3\frac{13}{18} = 5\frac{24}{18}$
$= 6\frac{6}{18}$
$= 6\frac{1}{3}$

(f) $5\frac{7}{8} + 2\frac{5}{8} = 7\frac{12}{8}$
$= 8\frac{4}{8}$
$= 8\frac{1}{2}$

(g) $3\frac{5}{14} + 4\frac{11}{14} = 7\frac{16}{14}$
$= 8\frac{2}{14}$
$= 8\frac{1}{7}$

(h) $3\frac{14}{15} + 1\frac{4}{15} = 4\frac{18}{15}$
$= 5\frac{3}{15}$
$= 5\frac{1}{5}$

5. $1\frac{1}{100} + 1\frac{2}{100} + 1\frac{3}{100} + \ldots\ldots + 1\frac{97}{100} + 1\frac{98}{100} + 1\frac{99}{100}$

3 3 3

$1\frac{1}{100} + 1\frac{99}{100} = 3$

There are 49 pairs of 3.

$1\frac{50}{100}$ is the unpaired mixed number.

$49 \times 3 + 1\frac{50}{100} = 147 + 1\frac{50}{100}$
$= 148\frac{50}{100}$
$= 148\frac{1}{2}$

The sum of the number pattern is $148\frac{1}{2}$.

Exercise 6B Add and Subtract Mixed Numbers (2)

1. **(a)** $3\frac{4}{5} - 1\frac{1}{5} = 2\frac{3}{5}$

(b) $5\frac{1}{8} - 2\frac{5}{8} = 4\frac{9}{8} - 2\frac{5}{8}$
$= 2\frac{4}{8}$
$= 2\frac{1}{2}$

2. **(a)** $3\frac{5}{6} - 1\frac{2}{6} = 2\frac{3}{6}$
$= 2\frac{1}{2}$

(b) $5\frac{10}{12} - 4\frac{7}{12} = 1\frac{3}{12}$
$= 1\frac{1}{4}$

(c) $4 - 1\frac{3}{10} = 3\frac{10}{10} - 1\frac{3}{10}$
$= 2\frac{7}{10}$

(d) $6\frac{3}{8} - 1\frac{4}{8} = 5\frac{11}{8} - 1\frac{4}{8}$
$= 4\frac{7}{8}$

(e) $2\frac{1}{15} - 1\frac{7}{15} = 1\frac{16}{15} - 1\frac{7}{15}$
$= \frac{9}{15}$
$= \frac{3}{5}$

(f) $4\frac{4}{9} - 2\frac{7}{9} = 3\frac{13}{9} - 2\frac{7}{9}$
$= 1\frac{6}{9}$
$= 1\frac{2}{3}$

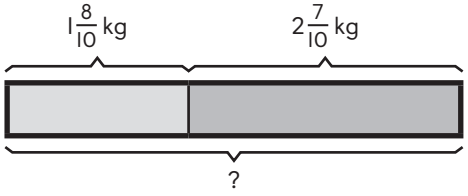
3. **(a)**
$$\begin{array}{r} 8\frac{13}{18} \\ -\,5\frac{7}{18} \\ \hline 3\frac{6}{18} = 3\frac{1}{3} \end{array}$$

(b)
$$\begin{array}{r} 9\frac{7}{6} \\ \cancel{10}\,\cancel{1}\,\cancel{6} \\ -\,5\frac{5}{6} \\ \hline 4\frac{2}{6} = 4\frac{1}{3} \end{array}$$

4. $3\frac{6}{12} + 1\frac{11}{12} = 4\frac{17}{12}$
$= 5\frac{5}{12}$
$5\frac{5}{12} - 1\frac{8}{12} = 4\frac{17}{12} - 1\frac{8}{12}$
$= 3\frac{9}{12}$
$= 3\frac{3}{4}$

Exercise 6C Word Problems (1)

1.



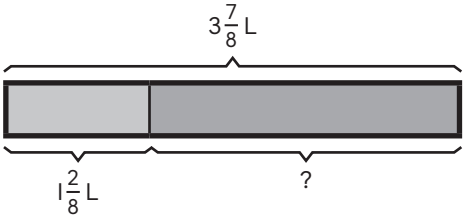
$1\frac{8}{10} + 2\frac{7}{10} = 3\frac{15}{10}$

$= 4\frac{5}{10}$

$= 4\frac{1}{2}$

Ms. Johnson bought $4\frac{1}{2}$ kilograms of flour.

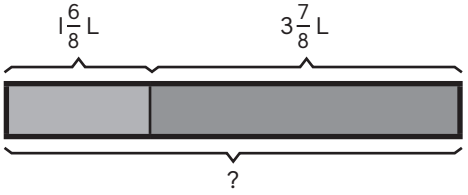
2.



$3\frac{7}{8} - 1\frac{2}{8} = 2\frac{5}{8}$

$2\frac{5}{8}$ liters of milk were left.

3.

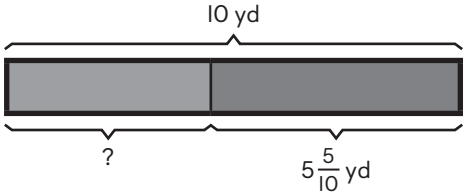


$1\frac{6}{8} + 3\frac{7}{8} = 4\frac{13}{8}$

$= 5\frac{5}{8}$

Karen has $5\frac{5}{8}$ liters of orange juice.

4.

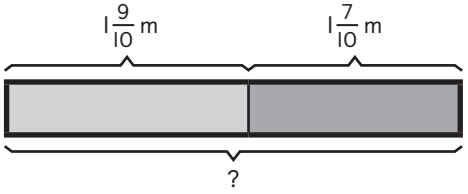


$10 - 5\frac{5}{10} = 4\frac{5}{10}$

$= 4\frac{1}{2}$

The tailor used $4\frac{1}{2}$ yards of lace.

5.



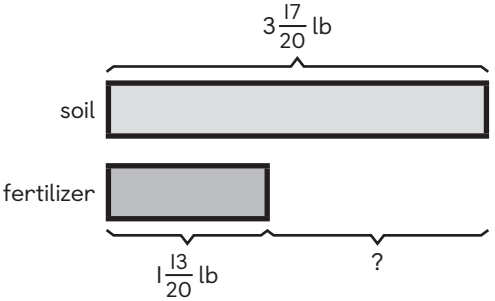
$1\frac{9}{10} + 1\frac{7}{10} = 2\frac{16}{10}$

$= 3\frac{6}{10}$

$= 3\frac{3}{5}$

Regina used $3\frac{3}{5}$ meters of rope altogether.

6.



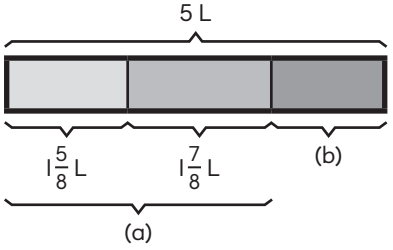
$3\frac{17}{20} - 1\frac{13}{20} = 2\frac{4}{20}$

$= 2\frac{1}{5}$

The gardener has $2\frac{1}{5}$ pounds more soil than fertilizer.

Exercise 6C Word Problems (2)

1.



(a) $1\frac{5}{8} + 1\frac{7}{8} = 2\frac{12}{8}$

$= 3\frac{4}{8}$

$= 3\frac{1}{2}$

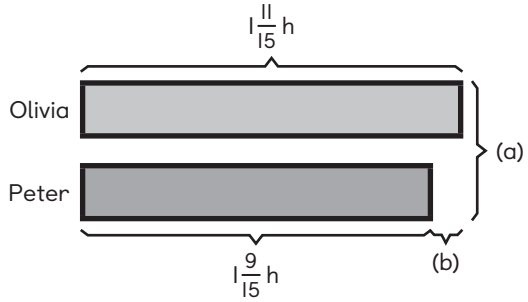
Mr. Miller's family drank $3\frac{1}{2}$ liters of juice on the two days.

(b) $5 - 3\frac{1}{2} = 4\frac{2}{2} - 3\frac{1}{2}$

$= 1\frac{1}{2}$

$1\frac{1}{2}$ liters of juice were left.

2.



(a) $1\frac{11}{15} + 1\frac{9}{15} = 2\frac{20}{15}$

$= 3\frac{5}{15}$

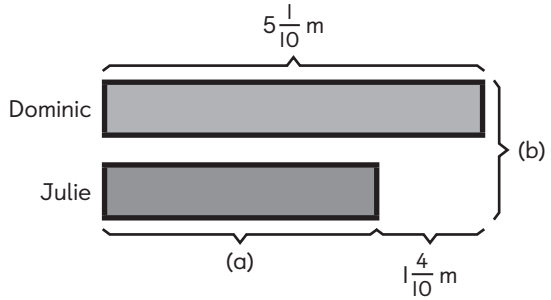
$= 3\frac{1}{3}$

Both of them took $3\frac{1}{3}$ hours to complete the puzzle.

(b) $1\frac{11}{15} - 1\frac{9}{15} = \frac{2}{15}$

Olivia spent $\frac{2}{15}$ hour longer on the puzzle.

3.



(a) $5\frac{1}{10} - 1\frac{4}{10} = 4\frac{11}{10} - 1\frac{4}{10}$

$= 3\frac{7}{10}$

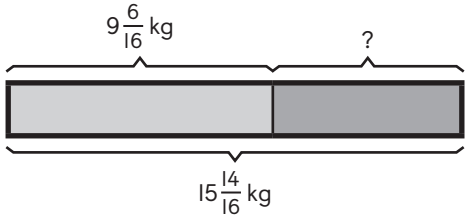
Julie painted $3\frac{7}{10}$ meters of the fence.

(b) $5\frac{1}{10} + 3\frac{7}{10} = 8\frac{8}{10}$

$= 8\frac{4}{5}$

Both of them painted $8\frac{4}{5}$ meters of the fence altogether.

4. **(a)**

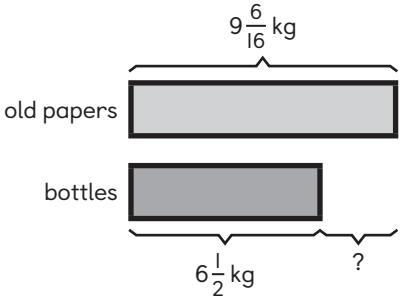


$15\frac{14}{16} - 9\frac{6}{16} = 6\frac{8}{16}$

$= 6\frac{1}{2}$

$6\frac{1}{2}$ kilograms of recycled bottles are collected.

(b)



$9\frac{6}{16} - 6\frac{8}{16} = 8\frac{22}{16} - 6\frac{8}{16}$

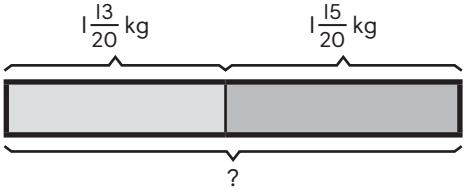
$= 2\frac{14}{16}$

$= 2\frac{7}{8}$

The old papers are heavier by $2\frac{7}{8}$ kilograms.

Exercise 6C Word Problems (3)

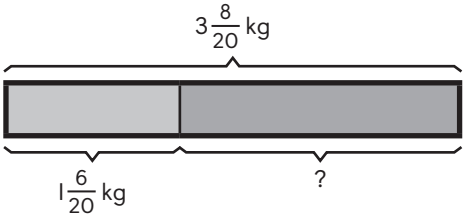
1.



$1\frac{13}{20} + 1\frac{15}{20} = 2\frac{28}{20}$

$= 3\frac{8}{20}$

$3\frac{8}{20}$ kilograms of berries were brought to the party altogether.

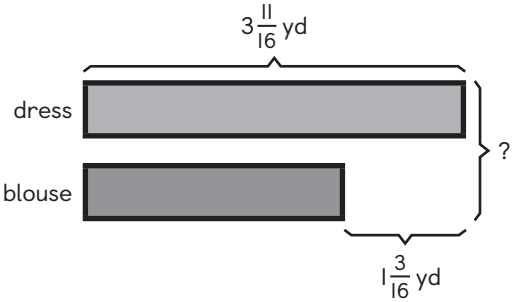


$3\frac{8}{20} - 1\frac{6}{20} = 2\frac{2}{20}$

$= 2\frac{1}{10}$

$2\frac{1}{10}$ kilograms of berries were left.

2.



$3\frac{11}{16} - 1\frac{3}{16} = 2\frac{8}{16}$

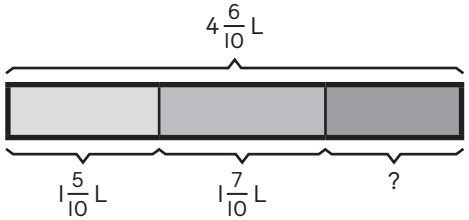
The tailor used $2\frac{8}{16}$ yards of cloth to make the blouse.

$3\frac{11}{16} + 2\frac{8}{16} = 5\frac{19}{16}$

$= 6\frac{3}{16}$

The tailor used $6\frac{3}{16}$ yards of cloth altogether.

3.



$1\frac{5}{10} + 1\frac{7}{10} = 2\frac{12}{10}$

$= 3\frac{2}{10}$

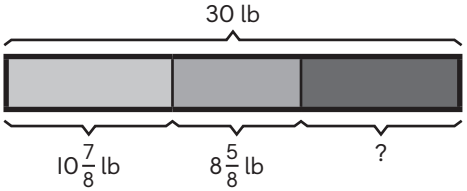
Mason used $3\frac{2}{10}$ liters of paint altogether.

$4\frac{6}{10} - 3\frac{2}{10} = 1\frac{4}{10}$

$= 1\frac{2}{5}$

Mason had $1\frac{2}{5}$ liters of paint left.

4.



$10\frac{7}{8} + 8\frac{5}{8} = 18\frac{12}{8}$

$= 19\frac{4}{8}$

$= 19\frac{1}{2}$

The chef used $19\frac{1}{2}$ pounds of rice on the first two days.

$30 - 19\frac{1}{2} = 29\frac{2}{2} - 19\frac{1}{2}$

$= 10\frac{1}{2}$

The chef used $10\frac{1}{2}$ pounds of rice on the third day.

Exercise 6D Multiply a Fraction and a Whole Number (I)

1. **(a)** $\frac{7}{10} = \frac{1}{10} + \frac{1}{10} + \boxed{\frac{1}{10}} + \boxed{\frac{1}{10}} + \boxed{\frac{1}{10}} + \boxed{\frac{1}{10}} + \boxed{\frac{1}{10}}$

$= \underline{\quad 7 \quad} \times \boxed{\frac{1}{10}}$

There are $\underline{\quad 7 \quad}$ tenths in $\frac{7}{10}$.

(b) $\frac{1}{5} \times 9 = \boxed{\frac{9}{5}}$

$= \underline{\quad 1\frac{4}{5} \quad}$

2. **(a)** $\frac{1}{2} \times 5 = \frac{5}{2}$

$= 2\frac{1}{2}$

(b) $\frac{1}{3} \times 7 = \frac{7}{3}$

$= 2\frac{1}{3}$

(c) $\frac{1}{4} \times 10 = \frac{10}{4}$

$= 2\frac{2}{4}$

$= 2\frac{1}{2}$

(d) $\frac{1}{7} \times 10 = \frac{10}{7}$

$= 1\frac{3}{7}$

(e) $\frac{1}{8} \times 15 = \frac{15}{8}$

$= 1\frac{7}{8}$

(f) $12 \times \frac{1}{9} = \frac{12}{9}$

$= 1\frac{3}{9}$

$= 1\frac{1}{3}$

(g) $15 \times \frac{1}{10} = \frac{15}{10}$

$= 1\frac{5}{10}$

$= 1\frac{1}{2}$

(h) $16 \times \frac{1}{12} = \frac{16}{12}$

$= 1\frac{4}{12}$

$= 1\frac{1}{3}$

(i) $16 \times \frac{1}{14} = \frac{16}{14}$

$= 1\frac{2}{14}$

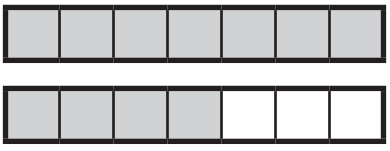
$= 1\frac{1}{7}$

(j) $18 \times \frac{1}{15} = \frac{18}{15}$

$= 1\frac{3}{15}$

$= 1\frac{1}{5}$

3.



$\frac{11}{7} = 11 \times \frac{1}{7}$

There are 11 sevenths in $\frac{11}{7}$.

4. **(a)** $\frac{1}{9} \times 24 = \frac{24}{9}$

$= 2\frac{6}{9}$

$= 2\frac{2}{3}$

(b) 15 twelfths $= \frac{15}{12}$

$= 1\frac{3}{12}$

$= 1\frac{1}{4}$

5. $\frac{1}{4} \times 9 = \frac{9}{4}$

$= 2\frac{1}{4}$

9 such cups can hold $2\frac{1}{4}$ liters of water.

6. $\frac{1}{8} \times 10 = \frac{10}{8}$

$= 1\frac{2}{8}$

$= 1\frac{1}{4}$

The chef uses $1\frac{1}{4}$ kilograms of meat to make 10 such burgers.

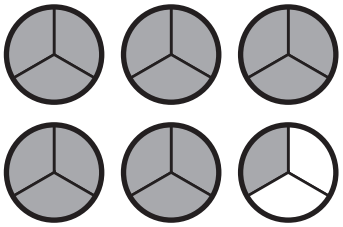
7. $\frac{1}{5} \times 8 = \frac{8}{5}$

$= 1\frac{3}{5}$

The total length of the bracelets is $1\frac{3}{5}$ yards.

Exercise 6D Multiply a Fraction and a Whole Number (2)

1. **(a)**



$\frac{2}{3} \times 8 = \boxed{\frac{2 \times 8}{3}}$

$= \boxed{\frac{16}{3}}$

$= 5\frac{1}{3}$

(b)

$\frac{3}{8} \times 6 = \boxed{\frac{3 \times 6}{8}}$

$= \boxed{\frac{18}{8}}$

$= \boxed{\frac{9}{4}}$

$= 2\frac{1}{4}$

2. **(a)** $\frac{5}{6} \times 40 = \frac{5 \times 40}{6}$

$= \frac{200}{6}$

$= 33\frac{2}{6}$

$= 33\frac{1}{3}$

(b) $\frac{7}{10} \times 30 = \frac{7 \times 30}{10}$

$= \frac{210}{10}$

$= 21$

(c) $\frac{5}{8} \times 12 = \frac{5 \times 12}{8}$

$= \frac{60}{8}$

$= 7\frac{4}{8}$

$= 7\frac{1}{2}$

(d) $\frac{3}{4} \times 30 = \frac{3 \times 30}{4}$

$= \frac{90}{4}$

$= 22\frac{2}{4}$

$= 22\frac{1}{2}$

(e) $40 \times \frac{7}{12} = \frac{40 \times 7}{12}$

$= \frac{280}{12}$

$= 23\frac{4}{12}$

$= 23\frac{1}{3}$

(f) $33 \times \frac{5}{9} = \frac{33 \times 5}{9}$

$= \frac{165}{9}$

$= 18\frac{3}{9}$

$= 18\frac{1}{3}$

(g) $50 \times \frac{3}{8} = \frac{50 \times 3}{8}$

$= \frac{150}{8}$

$= 18\frac{6}{8}$

$= 18\frac{3}{4}$

(h) $48 \times \frac{7}{9} = \frac{48 \times 7}{9}$

$= \frac{336}{9}$

$= 37\frac{3}{9}$

$= 37\frac{1}{3}$

3. $\frac{3}{10} \times 8 = \frac{24}{10}$

$= 2\frac{4}{10}$

$= 2\frac{2}{5}$

Wilson drinks $2\frac{2}{5}$ liters of milk in 8 days.

Exercise 6D Multiply a Fraction and a Whole Number (3)

1. **(a)** $\frac{3}{4}$ of $20 = \frac{3}{4}$ (×) 20

$= \boxed{\frac{3 \times 20}{4}}$

$= \boxed{\frac{60}{4}}$

$= \underline{15}$

(b) $\frac{3}{5}$ of $15 = \frac{3}{5}$ (×) 15

$= \boxed{\frac{3 \times 15}{5}}$

$= \boxed{\frac{45}{5}}$

$= \underline{9}$

2. **(a)** $\frac{5}{6}$ of $48 = \frac{5}{6} \times 48$

$= \frac{5 \times 48}{6}$

$= 40$

3. **(a)** $\frac{2}{3}$ of $21 = \frac{2}{3} \times 21$

$= \frac{2 \times 21}{3}$

$= \frac{42}{3}$

$= 14$

(b) $\frac{3}{5}$ of $25 = \frac{3}{5} \times 25$

$= \frac{3 \times 25}{5}$

$= \frac{75}{5}$

$= 15$

(c) $\frac{5}{6}$ of $30 = \frac{5}{6} \times 30$

$= \frac{5 \times 30}{6}$

$= \frac{150}{6}$

$= 25$

(d) $\frac{4}{7}$ of $35 = \frac{4}{7} \times 35$

$= \frac{4 \times 35}{7}$

$= \frac{140}{7}$

$= 20$

(e) $\frac{3}{8}$ of $32 = \frac{3}{8} \times 32$

$= \frac{3 \times 32}{8}$

$= \frac{96}{8}$

$= 12$

(f) $\frac{2}{9}$ of $45 = \frac{2}{9} \times 45$

$= \frac{2 \times 45}{9}$

$= \frac{90}{9}$

$= 10$

4. Method 1:

$\frac{3}{8} \times 32 = \frac{3 \times 32}{8}$

$= \frac{96}{8}$

$= 12$

Method 2:

8 units = \$32

1 unit = $32 \div 8$

= \$4

3 units = 3×4

= \$12

Thomas spent \$12 on the racket.

Exercise 6E Line Plots (1)

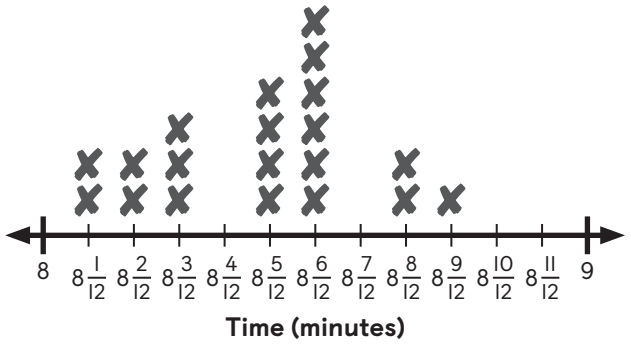
1. **(a)** $3\frac{5}{10}$ or $3\frac{1}{2}$ **(b)** $3\frac{7}{10}$

(c) $3\frac{3}{10}$ **(d)** $2\frac{3}{10}$

(e) 10 **(f)** 4

(g) 7 **(h)** 20

2. **(a)** **Traveling Time from Home to School**



Key: Each ✘ represents 1 student.

(b) $8\frac{3}{12}$ or $8\frac{1}{4}$ **(c)** $8\frac{6}{12}$ or $8\frac{1}{2}$

(d) 7 **(e)** 11

(f) 3

Exercise 6E Line Plots (2)

1. $11\frac{4}{5} - 10\frac{1}{5} = 1\frac{3}{5}$

The difference in height is $1\frac{3}{5}$ inches.

2. Accept all correct answers. Example:

$22 = 21\frac{5}{5}$

$10\frac{?}{5} + 11\frac{?}{5} = 21\frac{5}{5}$

By guess and check, $10\frac{1}{5} + 11\frac{4}{5} = 21\frac{5}{5}$

Their heights can possibly be $10\frac{1}{5}$ inches and $11\frac{4}{5}$ inches.

3. $11\frac{4}{5} + 3\frac{3}{5} = 14\frac{7}{5}$

$= 15\frac{2}{5}$

The height of the new plant is $15\frac{2}{5}$ inches.

4. $3 - 1\frac{2}{8} = 2\frac{8}{8} - 1\frac{2}{8}$

$= 1\frac{6}{8}$

$= 1\frac{3}{4}$

The difference is $1\frac{3}{4}$ pints of isotonic drink.

5. $1\frac{6}{8}$ pints is the most common amount of isotonic drink drunk by the athletes.

$1\frac{6}{8} + 1\frac{6}{8} + 1\frac{6}{8} + 1\frac{6}{8} = 4\frac{24}{8}$

$= 7$

This particular group of athletes drank a total of 7 pints of isotonic drink.

6. Accept all correct answers. Example:

$6 = 5\frac{8}{8}$

$1\frac{?}{8} + 2\frac{?}{8} + 2\frac{?}{8} = 5\frac{8}{8}$

By guess and check, $1\frac{2}{8} + 2\frac{2}{8} + 2\frac{4}{8} = 5\frac{8}{8}$

Their amount of isotonic drink intake could be $1\frac{2}{8}$ pints, $2\frac{2}{8}$ pints, and $2\frac{4}{8}$ pints.

Chapter Practice

1. B

2. C

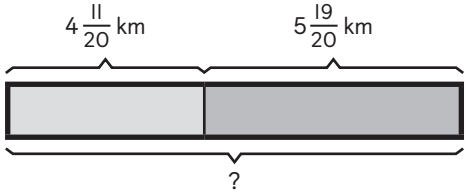
3. C

4. A

5. A

6. B, E

7.



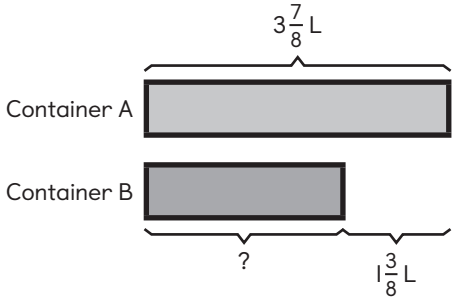
$4\frac{11}{20} + 5\frac{19}{20} = 9\frac{30}{20}$

$= 10\frac{10}{20}$

$= 10\frac{1}{2}$

The total distance Angela jogged was $10\frac{1}{2}$ kilometers.

8.

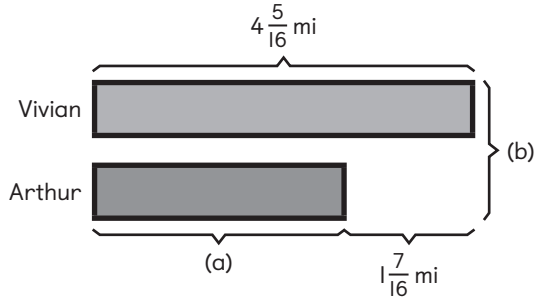


$3\frac{7}{8} - 1\frac{3}{8} = 2\frac{4}{8}$

$= 2\frac{1}{2}$

The capacity of Container B is $2\frac{1}{2}$ liters.

9.



(a) $4\frac{5}{16} - 1\frac{7}{16} = 3\frac{21}{16} - 1\frac{7}{16}$

$= 2\frac{14}{16}$

$= 2\frac{7}{8}$

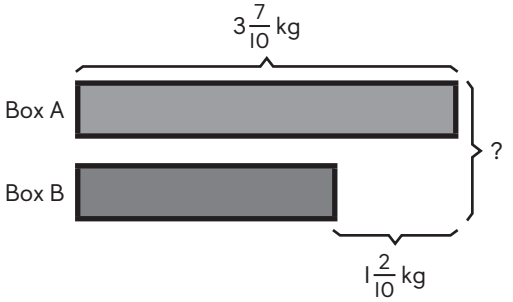
Arthur cycled $2\frac{7}{8}$ miles.

(b) $4\frac{5}{16} + 2\frac{14}{16} = 6\frac{19}{16}$

$= 7\frac{3}{16}$

Vivian and Arthur cycled $7\frac{3}{16}$ miles altogether.

10.



$3\frac{7}{10} - 1\frac{2}{10} = 2\frac{5}{10}$

The mass of Box B is $2\frac{5}{10}$ kilograms.

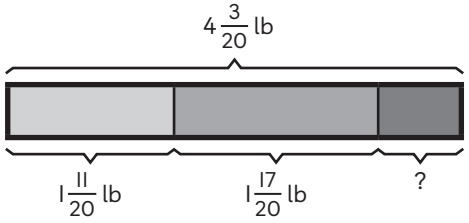
$3\frac{7}{10} + 2\frac{5}{10} = 5\frac{12}{10}$

$= 6\frac{2}{10}$

$= 6\frac{1}{5}$

The total mass of the two boxes is $6\frac{1}{5}$ kilograms.

11.



$1\frac{11}{20} + 1\frac{17}{20} = 2\frac{28}{20}$

$= 3\frac{8}{20}$

Alejandro and Jenny poured out $3\frac{8}{20}$ pounds of sand in all.

$4\frac{3}{20} - 3\frac{8}{20} = 3\frac{23}{20} - 3\frac{8}{20}$

$= \frac{15}{20}$

$= \frac{3}{4}$

There was $\frac{3}{4}$ pound of sand left in the container.

12. $2\frac{1}{8} + 2\frac{1}{8} = 4\frac{2}{8}$

$2\frac{2}{8} + 2\frac{2}{8} + 2\frac{2}{8} = 6\frac{6}{8}$

$2\frac{3}{8} + 2\frac{3}{8} + 2\frac{3}{8} + 2\frac{3}{8} + 2\frac{3}{8} = 10\frac{15}{8}$

$= 11\frac{7}{8}$

$2\frac{4}{8} + 2\frac{4}{8} = 4\frac{8}{8}$

$= 5$

$4\frac{2}{8} + 6\frac{6}{8} + 11\frac{7}{8} + 5 = 26\frac{15}{8}$

$= 27\frac{7}{8}$

I do not agree with Edwin.
$27\frac{7}{8}$ is closer to 28 than 26. The total amount of flour is about 28 kilograms.