

SAXON HOMESCHOOL

Middle Grades Sampler

Math 5/4, Math 6/5, Math 7/6, Math 8/7, and Algebra 1/2

Math 5/4, Math 6/5, Math 7/6, Math 8/7, and Algebra 1/2 form a series of courses to move students from primary grades to algebra. Each course contains a series of daily lessons covering all areas of general math. Each lesson presents a small portion of math content (called an increment) that builds on prior knowledge and understanding.

Students are not required or expected to grasp a concept fully the first time it is presented. After an increment is introduced, it becomes a part of the student's daily work for the rest of the year. Students will have many opportunities to gain understanding and to achieve mastery. This cumulative, continual practice ensures that students will retain what they have learned.

This sampler includes materials that are representative of the Saxon math program, including samples of Lessons and Investigations.

We hope these materials will assist you in your evaluation of the Saxon program.

Math 8/7

Table of Contents

Lesson 35, Adding, Subtracting, Multiplying, and Dividing Decimal Numbers.....	64
Lesson 65, Ratio Problems Involving Totals.....	71
Lesson 107, Slope.....	77
Investigation 5, Creating Graphs	86

Math 8/7, Lesson 35

Sample taken from Math 8/7 (Third Edition), page 236

236 Saxon Math 8/7—Homeschool

Example 2 Add: $0.1 + 0.2 + 0.3 + 0.4$

Solution We align the decimal points vertically and add. The sum is 1.0, not 0.10. Since 1.0 equals 1, we can simplify the answer to 1.

$$\begin{array}{r} 0.1 \\ 0.2 \\ 0.3 \\ + 0.4 \\ \hline 1.0 = 1 \end{array}$$

Example 3 Subtract: $12.3 - 4.567$

Solution We write the first number above the second number, aligning the decimal points. We write zeros in the empty places and subtract.

$$\begin{array}{r} 0^1 1^1 2^1 3^1 0^1 0^1 \\ 12.300 \\ - 4.567 \\ \hline 7.733 \end{array}$$

Example 4 Subtract: $5 - 4.32$

Solution We write the whole number 5 with a decimal point and write zeros in the two empty decimal places. Then we subtract.

$$\begin{array}{r} 4^1 9^1 \\ 5.00 \\ - 4.32 \\ \hline 0.68 \end{array}$$

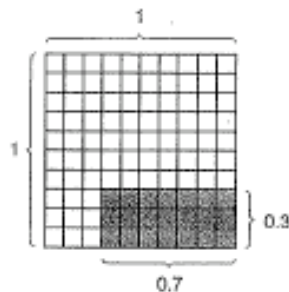
Multiplying decimal numbers If we multiply the fractions three tenths and seven tenths, the product is twenty-one hundredths.

$$\frac{3}{10} \times \frac{7}{10} = \frac{21}{100}$$

Likewise, if we multiply the decimal numbers three tenths and seven tenths, the product is twenty-one hundredths.

$$0.3 \times 0.7 = 0.21$$

Here we use an area model to illustrate this multiplication:



Each side of the square is one unit in length. We multiply three tenths of one side by seven tenths of a perpendicular

Math 8/7, Lesson 35

Sample taken from Math 8/7 (Third Edition), page 237

Lesson 35 237

side. The product is an area that contains twenty-one hundredths of the square.

$$0.3 \times 0.7 = 0.21$$

Notice that the factors each have one decimal place and the product has two decimal places. **When we multiply decimal numbers, the product has as many decimal places as there are in all the factors combined.**

Example 5 Multiply: $(0.23)(0.4)$

Solution We need not align decimal points to multiply. We set up the problem as though we were multiplying whole numbers. After multiplying, we count the number of decimal places in both factors. There are a total of three decimal places, so we write the product with three decimal places. We count from right to left, writing one or more zeros in front as necessary. The product of 0.23 and 0.4 is **0.092**.

$$\begin{array}{r} 0.23 \\ \times 0.4 \\ \hline 92 \\ \\ 0.23 \quad 2 \text{ places} \\ \times 0.4 \quad 1 \text{ place} \\ \hline \underline{0.092} \quad 3 \text{ places} \end{array}$$

Example 6 Multiply: 35×0.4

Solution We set up the problem as though we were multiplying whole numbers. After multiplying, we count the total number of decimal places in the factors. Then we place a decimal point in the product so that the product has the same number of decimal places as there are in the factors combined. After placing the decimal point, we simplify the result.

$$\begin{array}{r} 35 \quad 0 \text{ places} \\ \times 0.4 \quad 1 \text{ place} \\ \hline 14.0 \quad 1 \text{ place} \\ \\ 14.0 = 14 \end{array}$$

Example 7 Multiply: $(0.2)(0.3)(0.04)$

Solution Sometimes we can perform the multiplication mentally. First we multiply as though we were multiplying whole numbers: $2 \cdot 3 \cdot 4 = 24$. Then we count decimal places. There are four decimal places in the three factors. Starting from the right side of 24, we count to the left four places. We write zeros in the empty places.

$$\underline{24} \rightarrow 0.0024$$

Math 8/7, Lesson 35

Sample taken from Math 8/7 (Third Edition), page 238

238 Saxon Math 8/7—Homeschool

Dividing decimal numbers Dividing a decimal number by a whole number is similar to dividing money. The decimal point in the answer is straight up from the decimal point in the division box.

Example 8 Divide: $3.425 \div 5$

Solution We rewrite the problem with a division box. We place a decimal point in the answer directly above the decimal point in the division box. Then we divide as though we were dividing whole numbers. The answer is **0.685**.

$$\begin{array}{r} 0.685 \\ 5 \overline{)3.425} \\ \underline{30} \\ 42 \\ \underline{40} \\ 25 \\ \underline{25} \\ 0 \end{array}$$

Example 9 Divide: $0.0144 \div 8$

Solution We place the decimal point in the answer directly above the decimal point inside the division box. We write a digit in every place following the decimal point until the division is completed. If we cannot perform a division, we write a zero in that place. The answer is **0.0018**.

$$\begin{array}{r} 0.0018 \\ 8 \overline{)0.0144} \\ \underline{8} \\ 64 \\ \underline{64} \\ 0 \end{array}$$

Example 10 Divide: $1.2 \div 5$

Solution We do not write a decimal division answer with a remainder. Since a decimal point fixes place values, we may write a zero in the next decimal place. This zero does not change the value of the number, but it does let us continue dividing. The answer is **0.24**.

$$\begin{array}{r} 0.24 \\ 5 \overline{)1.20} \\ \underline{10} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

LESSON PRACTICE

Practice set* Simplify:

a. $1.2 + 3.45 + 23.6$

b. $4.5 + 0.51 + 6 + 12.4$

c. $0.2 + 0.4 + 0.6 + 0.8$

d. $36.274 - 5.39$

e. $16.7 - 1.936$

f. $12 - 0.875$

Math 8/7, Lesson 35

Sample taken from Math 8/7 (Third Edition), page 239

Lesson 35 239

g. 4.2×0.24

h. $(0.12)(0.06)$

i. 5.4×7

j. $0.3 \times 0.2 \times 0.1$

k. $(0.04)(10)$

l. 0.045×0.6

m. $14.4 \div 6$

n. $0.048 \div 8$

o. $3.4 \div 5$

p. $0.3 \div 6$

MIXED PRACTICE

Problem set

1. During the first six months of the year, the Montgomerys' ⁽²⁰⁾ monthly electric bills were \$128.45, \$131.50, \$112.30, \$96.25, \$81.70, and \$71.70. How can the Montgomerys find their average monthly electric bill for the first six months of the year?

2. There were $2\frac{1}{2}$ gallons of milk in the refrigerator before ^(22, 30) breakfast. There were $1\frac{3}{4}$ gallons after dinner. How many gallons of milk were consumed during the day?

3. A one-year subscription to a monthly magazine costs ⁽²⁰⁾ \$15.60. The regular newsstand price is \$1.75 per issue. How much is saved per issue by paying the subscription price?

4. Carlos ran one lap in 1 minute 3 seconds. Orlando ran one ⁽²⁰⁾ lap 5 seconds faster than Carlos. How many seconds did it take Orlando to run one lap?

5. The perimeter of the square equals ⁽²⁰⁾ the perimeter of the regular pentagon. Each side of the pentagon is 16 cm long. How long is each side of the square?



6. Diagram this statement. Then answer the questions ⁽²²⁾ that follow.

Two ninths of the 54 fish in the tank were guppies.

(a) How many of the fish were guppies?

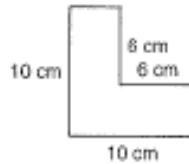
(b) How many of the fish were not guppies?

Math 8/7, Lesson 35

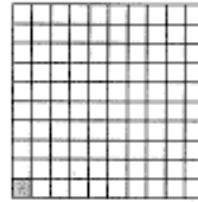
Sample taken from Math 8/7 (Third Edition), page 240

240 Saxon Math 8/7—Homeschool

7. A 6-by-6-cm square is cut from a 10-by-10-cm square sheet of paper as shown below. Refer to this figure to answer (a)–(c):



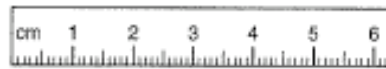
- (a) What was the area of the original square?
- (b) What was the area of the square that was cut out?
- (c) What is the area of the remaining figure?
8. (a) In the square at right, what fraction is not shaded?
(b) What decimal part of the square is not shaded?
(c) What percent of the square is not shaded?



9. The coordinates of three vertices of a rectangle are $(-3, 2)$, $(3, -2)$, and $(-3, -2)$.
- (a) What are the coordinates of the fourth vertex?
- (b) What is the area of the rectangle?

10. (a) Use words to write 100.075.
(b) Use digits to write the decimal number twenty-five hundred-thousandths.

11. Find the length of this segment



- (a) in centimeters.
- (b) in millimeters.

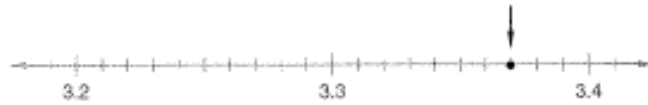
12. Miss Edwards bought 11.92 gallons of gasoline at $\$1.49\frac{9}{10}$ per gallon. Estimate how much she paid for the gasoline.

Math 8/7, Lesson 35

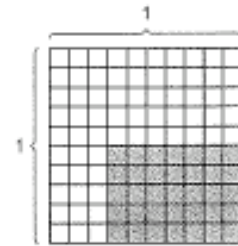
Sample taken from Math 8/7 (Third Edition), page 241

Lesson 35 241

13. What decimal number names the point marked with an arrow on this number line?
(34)



14. This figure illustrates the multiplication of which two decimal numbers? What is their product?
(35)



15. What decimal number is halfway between 1.2 and 1.3?
(34)

Solve:

16. $15x = 9 \cdot 10$
(3)

17. $f + 4.6 = 5.83$
(3, 35)

18. $8y = 46.4$
(3, 35)

19. $w - 3.4 = 12$
(3, 35)

Simplify:

20. $3.65 + 0.9 + 8 + 15.23$
(35)

21. $1\frac{1}{2} + 2\frac{2}{3} + 3\frac{3}{4}$
(36)

22. $1\frac{1}{2} \cdot 2\frac{2}{3} \cdot 3\frac{3}{4}$
(26)

23. $1\frac{1}{6} - \left(\frac{1}{2} + \frac{1}{3}\right)$
(23, 38)

24. $3\frac{1}{12} - 1\frac{3}{4}$
(23, 38)

25. $1.2 \div 10$
(35)

26. $(0.3)(0.4)(0.5)$
(35)

27. $\left(3\frac{1}{2} + 1\frac{3}{4}\right) \div \left(4 - 3\frac{1}{8}\right)$
(26, 38)

For problems 28 and 29, record an estimated answer and an exact answer.

28. $36.45 - 4.912$
(32, 35)

29. 4.2×0.9
(32, 35)

30. Use a protractor to draw a triangle that has two 45° angles.
(17)

Math 8/7, Lesson 65

Sample taken from Math 8/7 (Third Edition), page 445

Lesson 65 445

LESSON

65

Ratio Problems Involving Totals

WARM-UP

Facts Practice: Metric Conversions (Test M)

Mental Math:

a. 0.42×50

b. 1.25×10^{-1}

c. $\frac{9}{w} = \frac{15}{10}$

d. Convert 0.75 m to mm.

e. $5^3 - 10^2$

f. $\frac{9}{10}$ of \$4.00

g. What is the total cost of a \$20.00 item plus 7% sales tax?

Problem Solving:

Copy this problem and fill in the missing digits:

$$\begin{array}{r} 91\frac{1}{2} \\ \overline{) } \\ \\ \\ \\ \\ \\ \end{array}$$

NEW CONCEPT

Some ratio problems require that we use the total to solve the problem. Consider the following problem:

The ratio of boys to girls at the concert was 5 to 4. If there were 180 children at the concert, how many girls were there?

We begin by making a ratio box. This time we add a third row for the total number of children.

	Ratio	Actual Count
Boys	5	B
Girls	4	G
Total	9	180

In the ratio column we wrote 5 for boys and 4 for girls, then *added these to get 9 for the total ratio number*. We were given 180 as the actual count of children. This is a total. We can use two rows from this table to write a proportion. Since we were asked to find the number of girls, we will use the "girls" row.

Math 8/7, Lesson 65

Sample taken from Math 8/7 (Third Edition), page 446

446 Saxon Math 8/7—Homeschool

Because we know both total numbers, we will also use the “total” row. Using these numbers, we solve the proportion.

	Ratio	Actual Count	
Boys	5	B	
Girls	4	G	→ $\frac{4}{9} = \frac{G}{180}$
Total	9	180	→ $9G = 720$ $G = 80$

We find there were 80 girls at the concert. We can use this answer to complete the ratio box.

	Ratio	Actual Count
Boys	5	100
Girls	4	80
Total	9	180

Example The ratio of football players to soccer players in the room was 5 to 7. If the football and soccer players in the room totaled 48, how many were football players?

Solution We use the information in the problem to form a table. We include a row for the total number of players. The total ratio number is 12.

	Ratio	Actual Count	
Football players	5	F	
Soccer players	7	S	→ $\frac{5}{12} = \frac{F}{48}$
Total players	12	48	→ $12F = 240$ $F = 20$

To find the number of football players, we write a proportion from the “football players” row and the “total players” row. We solve the proportion to find that there were **20 football players** in the room. From this information we can complete the ratio box.

	Ratio	Actual Count
Football players	5	20
Soccer players	7	28
Total players	12	48

Math 8/7, Lesson 65

Sample taken from Math 8/7 (Third Edition), page 447

Lesson 65 447

LESSON PRACTICE

Practice set Solve these problems. Begin by drawing a ratio box.

- a. Acrobats and clowns converged on the center ring in the ratio of 3 to 5. If a total of 72 acrobats and clowns performed in the center ring, how many were clowns?
- b. The ratio of young men to young women at the ball was 8 to 9. If 240 young men were in attendance, how many young people attended in all?

MIXED PRACTICE

Problem set 1. If 5 pounds of apples cost \$2.40, then

- ⁽⁴⁶⁾
- (a) what is the price per pound?
 - (b) what is the cost for 8 pounds of apples?

2. (a) Simplify and compare:

⁽⁴⁷⁾ $(0.3)(0.4) + (0.3)(0.5) \bigcirc 0.3(0.4 + 0.5)$

(b) What property is illustrated by this comparison?

3. Use a ratio box to solve this problem. The ratio of big fish to little fish in the pond was 4 to 11. If there were 1320 fish in the pond, how many big fish were there?

^(44, 40) 4. The car traveled 350 miles on 15 gallons of gasoline. The car averaged how many miles per gallon? Round the answer to the nearest tenth.

⁽²⁸⁾ 5. The average of 2 and 4 is 3. What is the average of the reciprocals of 2 and 4?

⁽⁵¹⁾ 6. Write 12 billion in scientific notation.

^(22, 26) 7. Diagram this statement. Then answer the questions that follow.

One sixth of the five dozen eggs were cracked.

- (a) How many eggs were not cracked?
- (b) What was the ratio of eggs that were cracked to eggs that were not cracked?
- (c) What percent of the eggs were cracked?

Math 8/7, Lesson 65

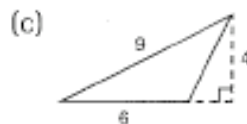
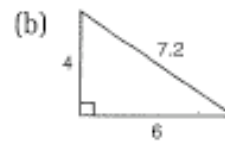
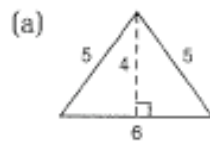
Sample taken from Math 8/7 (Third Edition), page 448

448 Saxon Math 8/7—Homeschool

8. (a) Draw segment AB . Draw segment DC parallel to segment AB but not the same length. Draw segments between the endpoints of segments AB and DC to form a quadrilateral.

(b) What type of quadrilateral was formed in (a)?

9. Find the area of each triangle. Dimensions are in centimeters.



10. What is the average of the two numbers indicated by arrows on the number line below?



Write equations to solve problems 11 and 12.

11. What number is 75 percent of 64?
(60)
12. What is the tax on a \$7.40 item if the sales-tax rate is 8%?
(48)
13. Find each sum:
(64)
- (a) $(-3) + (-8)$
- (b) $(+3) + (-8)$
- (c) $(-3) + (+8) + (-5)$
14. A circle is drawn on a coordinate plane with its center at the origin. One point on the circle is $(3, 4)$. Use a compass and graph paper to graph the circle. Then answer (a) and (b).
(Inv. 3)
- (a) What are the coordinates of the points where the circle intersects the x -axis?
- (b) What is the diameter of the circle?

Math 8/7, Lesson 65

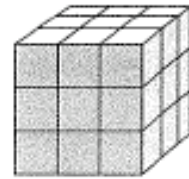
Sample taken from Math 8/7 (Third Edition), page 449

Lesson 65 449

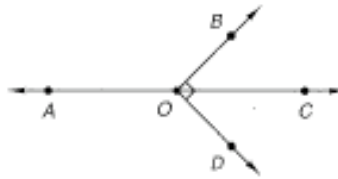
15. Use a unit multiplier to convert 0.95 liters to milliliters.
(50)

16. Evaluate: $ab + a + \frac{a}{b}$ if $a = 5$ and $b = 0.2$
(52)

17. How many small blocks were used
(13) to build this cube?



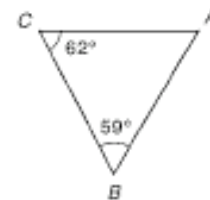
18. Recall that one angle is the complement of another angle
(40) if their sum is 90° , and that one angle is the supplement of another if their sum is 180° . In this figure, (a) which angle is a complement of $\angle BOC$ and (b) which angle is a supplement of $\angle BOC$?



19. Round each number to the nearest whole number to
(28, 33) estimate the product of 19.875 and $4\frac{7}{8}$.

20. Refer to $\triangle ABC$ at right to answer the
(58, 62) following questions:

- (a) What is the measure of $\angle A$?
- (b) Which side of the triangle is the longest side?
- (c) Triangle ABC is an acute triangle. It is also what other type of triangle?
- (d) Triangle ABC 's line of symmetry passes through which vertex?



21. (a) Describe how to find the median of this set of 12 scores.
(Inv. 4)

18, 17, 15, 20, 16, 14, 15, 16, 17, 18, 16, 19

- (b) What is the median of the set of scores?

Math 8/7, Lesson 65

Sample taken from Math 8/7 (Third Edition), page 450

450 Saxon Math 8/7—Homeschool

22. Answer true or false:

- (a) All equilateral triangles are congruent.
(b) All equilateral triangles are similar.

23. The bar was raised from 2.15 meters to 2.2 meters. How many centimeters was the bar raised?

Simplify:

24. $\frac{10^3 \cdot 10^3}{10^2}$

25. $\begin{array}{r} 4 \text{ days } 5 \text{ hr } 15 \text{ min} \\ - 1 \text{ days } 7 \text{ hr } 50 \text{ min} \\ \hline \end{array}$

26. $4.5 \div (0.4 + 0.5)$

27. $\frac{3 + 0.6}{3 - 0.6}$

28. $4\frac{1}{5} \div \left(1\frac{1}{6} \cdot 3\right)$

29. $3^2 + \sqrt{4 \cdot 7 - 3}$

30. $|-3| + 4[(5 - 2)(3 + 1)]$

Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 742

742 Saxon Math 8/7—Homeschool

LESSON

107 Slope

WARM-UP

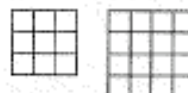
Facts Practice: Percent-Decimal-Fraction Equivalents (Test Q)

Mental Math:

- | | |
|---|---|
| a. 11000 (base 2) | b. DCCC |
| c. $(-2.5)(-4)$ | d. $(2.5 \times 10^6)^2$ |
| e. $2x - 1\frac{1}{2} = 4\frac{1}{2}$ | f. Convert -50°C to degrees Fahrenheit. |
| g. 75% of \$60 | h. 75% more than \$60 |
| i. $7 \times 8, -1, \div 5, \times 3, + 2, + 5, \times 7, + 1, \times 2, - 1, \div 3,$
$+ 3, \sqrt{\quad}$ | |

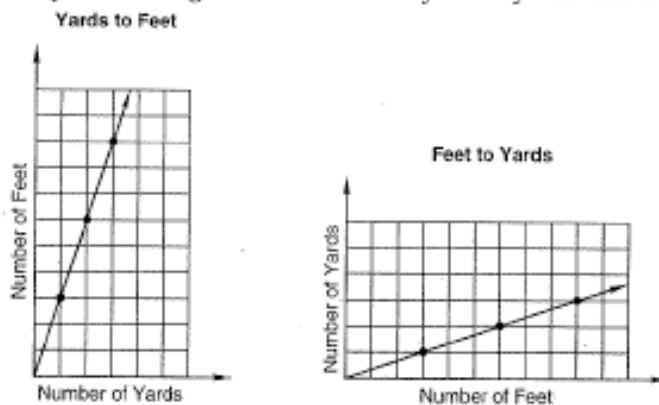
Problem Solving:

In the 3-by-3 square at right, we can find nine 1-by-1 squares, four 2-by-2 squares, and one 3-by-3 square. Find the total number of squares of any size in the 4-by-4 square.



NEW CONCEPT

Below are the graphs of two functions. The graph of the function on the left indicates the number of feet that equal a given number of yards. Changing the number of yards by one changes the number of feet by three. The graph of the function on the right shows the inverse relationship, the number of yards that equal a given number of feet. Changing the number of feet by one changes the number of yards by one third.



Notice that the graph of the function on the left has a steep upward slant going from left to right, while the graph of the function on the right also has an upward slant but is not as

Math 8/7, Lesson 107

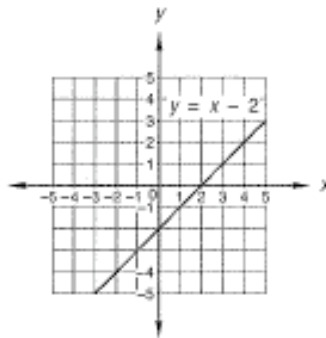
Sample taken from Math 8/7 (Third Edition), page 743

Lesson 107 743

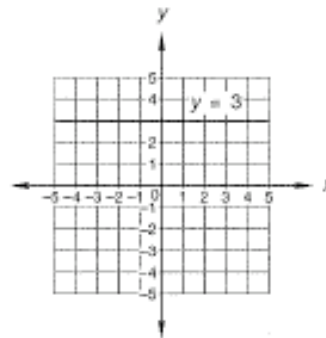
steep. The “slant” of the graph of a function is called its **slope**. We assign a number to a slope to indicate how steep the slope is and whether the slope is upward or downward. If the slope is upward, the number is positive. If the slope is downward, the number is negative. If the graph is horizontal, the slope is neither positive nor negative; it is zero. If the graph is vertical, the slope cannot be determined.

Example 1 State whether the slope of each line is positive, negative, zero, or cannot be determined.

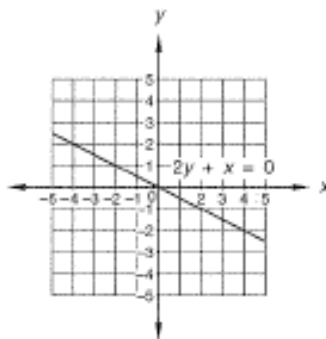
(a)



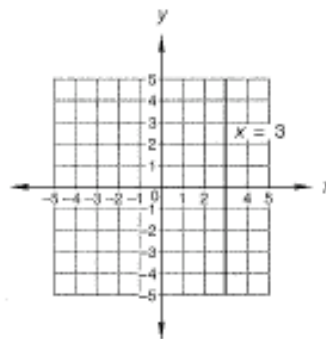
(b)



(c)



(d)



Solution To determine the sign of the slope, follow the graph of the function with your eyes *from left to right* as though you were reading.

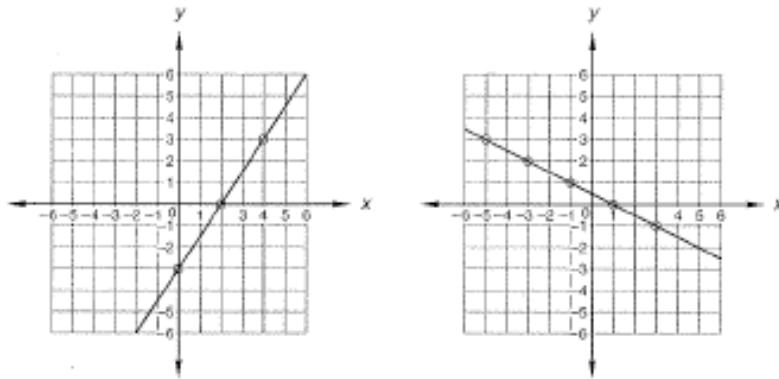
- (a) From left to right, the graphed line rises, so the slope is **positive**.
- (b) From left to right, the graphed line does not rise or fall, so the slope is **zero**.
- (c) From left to right, the graphed line slopes downward, so the slope is **negative**.
- (d) There is no left to right component of the graphed line, so we cannot determine if the line is rising or falling. The slope is not positive, not negative, and not zero. The slope of a vertical line **cannot be determined**.

Math 8/7, Lesson 107

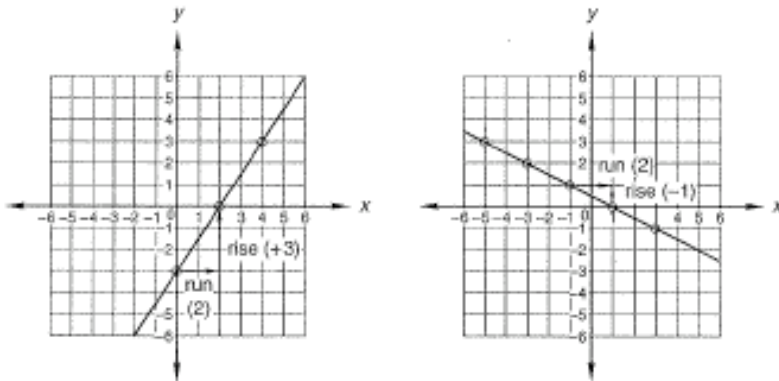
Sample taken from Math 8/7 (Third Edition), page 744

744 Saxon Math 8/7—Homeschool

To determine the numerical value of the slope of a line, it is helpful to draw a right triangle using the background grid of the coordinate plane and a portion of the graphed line. First we look for points where the graphed line crosses intersections of the grid. We have circled some of these points on the graphs below.



Next we select two points from the graphed line and, following the background grid, sketch the legs of a right triangle so that the legs intersect the chosen points. (It is a helpful practice to first select the point to the left and draw the horizontal leg to the right. Then draw the vertical leg.)



We use the words **run** and **rise** to describe the two legs of the right triangle. The *run* is the length of the horizontal leg, and the *rise* is the length of the vertical leg. We assign a positive sign to the rise if it goes up to meet the graphed line and a negative sign if it goes down to meet the graphed line. In the graph on the left, the run is 2 and the rise is +3. In the graph

Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 745

Lesson 107 745

on the right, the run is 2 and the rise is -1 . We use these numbers to write the slope of each graphed line.

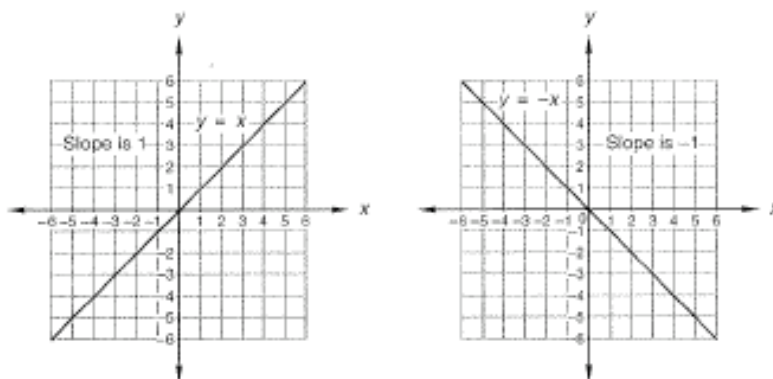
So the slopes of the graphed lines are these ratios:

$$\frac{\text{rise}}{\text{run}} = \frac{+3}{2} = \frac{3}{2} \quad \frac{\text{rise}}{\text{run}} = \frac{-1}{2} = -\frac{1}{2}$$

The slope of a line is the ratio of its rise to its run ("rise over run").

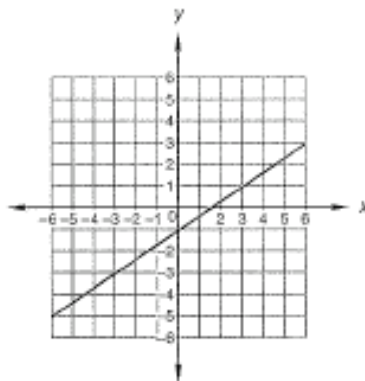
$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

A line whose rise and run have equal values has a slope of 1. A line whose rise has the opposite value of its run has a slope of -1 .



A line that is steeper than the lines above has a slope either greater than 1 or less than -1 . A line that is less steep than the lines above has a slope that is between -1 and 1.

Example 2 Find the slope of the graphed line below.

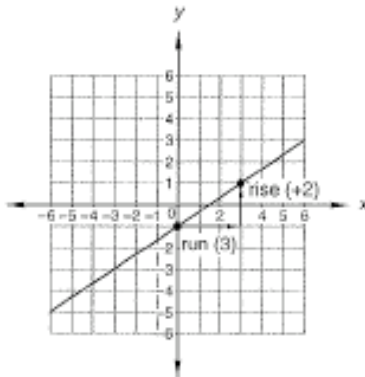


Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 746

746 Saxon Math 8/7—Homeschool

Solution We note that the slope is positive. We locate and select two points where the graphed line passes through intersections of the grid. We choose the points $(0, -1)$ and $(3, 1)$. Starting from the point to the left, $(0, -1)$, we draw the horizontal leg to the right. Then we draw the vertical leg up to $(3, 1)$.

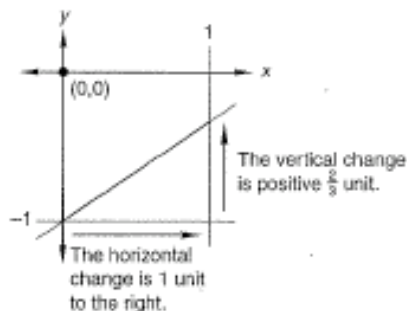


We see that the run is 3 and the rise is positive 2. We write the slope as “rise over run.”

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

Note that we could have chosen the points $(-3, -3)$ and $(3, 1)$. Had we done so, the run would be 6 and the rise 4. However, the slope would be the same because $\frac{4}{6}$ reduces to $\frac{2}{3}$.

One way to check the calculation of a slope is to “zoom in” on the graph. When the horizontal change is one unit to the right, the vertical change will equal the slope. To illustrate this, we will zoom in on the square just below and to the right of the origin on this graph. This method is a check for reasonableness of calculated slopes and can help prevent mistakes such as inverted slopes.



Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 747

Lesson 107 747

Activity: Slope

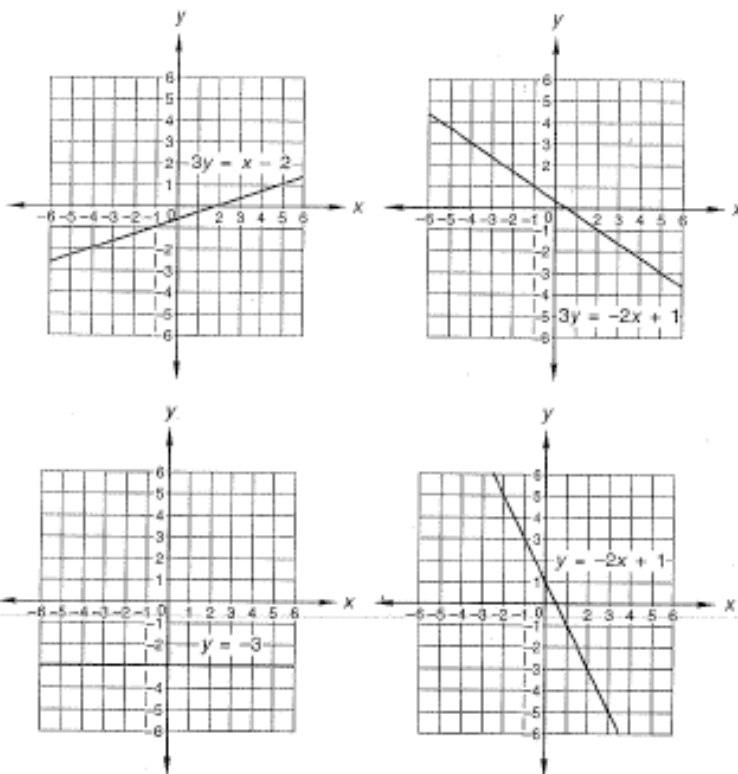
Materials needed:

- Activity Sheet 8 (available in *Saxon Math 8/7—Homeschool Tests and Worksheets*)

Calculate the slope (rise over run) of each graphed line on the activity sheet by drawing right triangles.

LESSON PRACTICE

- Practice set**
- Find the slopes of the “Yards to Feet” and the “Feet to Yards” graphs at the beginning of this lesson.
 - Find the slopes of graphs (a) and (c) in example 1.
 - Mentally calculate the slope of each graphed line below by counting the run and rise rather than by drawing right triangles.



- For each unit of horizontal change to the right on the graphed lines above, what is the vertical change?

Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 748

748 Saxon Math 8/7—Homeschool

MIXED PRACTICE

Problem set 1. The shirt regularly priced at \$21 was on sale for $\frac{2}{3}$ off.
(82) What was the sale price?

2. Nine hundred seventy-five billion is how much less than
(51) one trillion? Write the answer in scientific notation.

3. What is the (a) range and (b) mode of this set of numbers?
(Inv. 4)

16, 6, 8, 17, 14, 16, 12

Use ratio boxes to solve problems 4–6.

4. Riding her bike from home to the lake, Sonia averaged
(72) 18 miles per hour (per 60 minutes). If it took her 40 minutes to reach the lake, how far did she ride?

5. The ratio of earthworms to cutworms in the garden was
(65) 5 to 2. If there were 140 earthworms and cutworms in the garden, how many were earthworms?

6. The average cost of a new car increased 8 percent in one
(92) year. Before the increase the average cost of a new car was \$16,550. What was the average cost of a new car after the increase?

7. The points (3, -2), (-3, -2), and (-3, 6) are the vertices of
(88) a right triangle. Find the perimeter of the triangle.

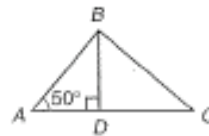
8. In this figure, $\angle ABC$ is a right angle.
(40)

(a) Find $m\angle ABD$.

(b) Find $m\angle DBC$.

(c) Find $m\angle BCD$.

(d) Which triangles in this figure are similar?



Write equations to solve problems 9–11.

9. Sixty is 125 percent of what number?
(77)

10. Sixty is what percent of 25?
(77)

Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 749

Lesson 107 749

11. Sixty is four more than twice what number?
(101)

12. In a can are 100 marbles: 10 yellow, 20 red, 30 green, and 40 blue.
(84, Inv. 10)

(a) If a marble is drawn from the can, what is the chance that the marble will not be red?

(b) If the first marble is not replaced and a second marble is drawn from the can, what is the probability that both marbles will be yellow?

13. Complete the table.
(40)

FRACTION	DECIMAL	PERCENT
$\frac{5}{6}$	(a)	(b)

14. Compare: $(x - y)^2 \bigcirc (y - x)^2$ if $x > y$
(78)

15. Multiply. Write the product in scientific notation.
(83)

$$(1.8 \times 10^{10})(9 \times 10^{-6})$$

16. (a) Between which two consecutive whole numbers is $\sqrt{600}$?
(100, 105)

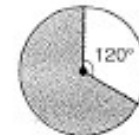
(b) What are the two square roots of 10?

17. Find three x, y pairs for the function $y = x + 1$.
(Inv. 9, 100)

(a) Graph these number pairs on a coordinate plane and draw a line through the points.

(b) What is the slope of the graphed line?

18. If the radius of this circle is 6 cm, what is the area of the shaded region?
(104)



Leave π as π .

19. Find the surface area of this rectangular solid. Dimensions are in inches.
(205)

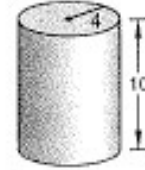


Math 8/7, Lesson 107

Sample taken from Math 8/7 (Third Edition), page 750

750 Saxon Math 8/7—Homeschool

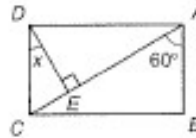
20. Find the volume of this right
(95) circular cylinder. Dimensions are
in centimeters.



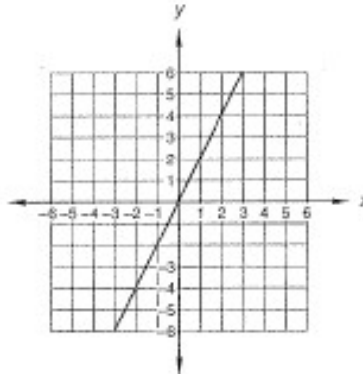
Use 3.14 for π .

21. Find the total surface area of the
(705) cylinder in problem 20.

22. The polygon $ABCD$ is a rectangle. Find $m\angle x$.
(40)



23. Find the slope of the graphed line:
(107)



24. Solve for x in each literal equation:
(106)

(a) $x - y = z$

(b) $w = xy$

Solve:

25. $\frac{a}{21} = \frac{1.5}{7}$
(98)

26. $6x + 5 = 7 + 2x$
(102)

Simplify:

27. $62 + 5\{20 - [4^2 + 3(2 - 1)]\}$
(83)

28. $\frac{(6x^2y)(2xy)}{4xy^2}$
(702)

29. $5\frac{1}{6} + 3.5 - \frac{1}{3}$
(42)

30. $\frac{(5)(-3)(2)(-4) + (-2)(-3)}{|-6|}$
(85)

Math 8/7, Investigation 5

Sample taken from Math 8/7 (Third Edition), page 346

INVESTIGATION 5

Focus on

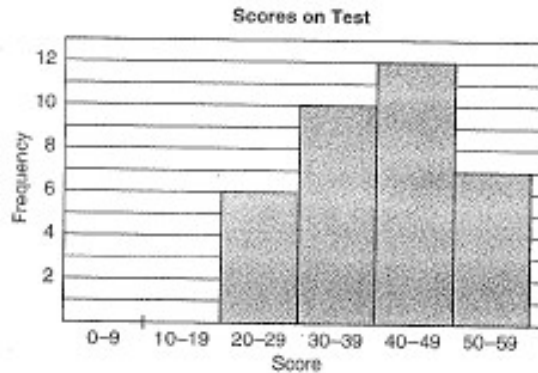


Creating Graphs

Recall from Investigation 4 that we considered a stem-and-leaf plot that a counselor created to display student test scores. If we rotate that plot 90°, the display resembles a vertical bar graph, or **histogram**.

1	3	5	6	6	8	8	8	9	9
0	0	2	2	4	5	6	6	8	9
0	0	1	1	2	3	3	5	7	7
0	1	1	2	3	5	8	8	8	8
2	3	4	5	6	7	8	9	0	0

A histogram is a special type of bar graph that displays data in equal-sized intervals. There are no spaces between the bars. The height of the bars in this histogram show the number of test scores in each interval.

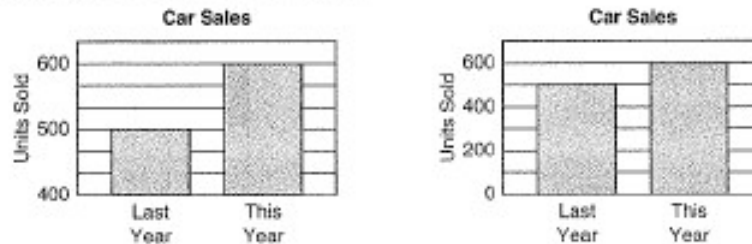


1. Changing the intervals can change the appearance of a histogram. Create a new histogram for the test scores itemized in the stem-and-leaf plot using the following intervals: 21–28, 29–36, 37–44, 45–52, and 53–60. Draw a break in the horizontal scale (\sim) between 0 and 21.

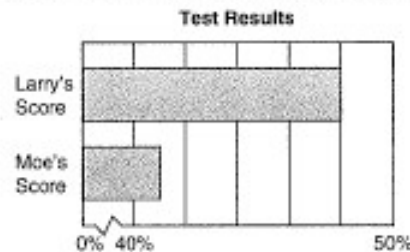
Math 8/7, Investigation 5

Sample taken from Math 8/7 (Third Edition), page 347

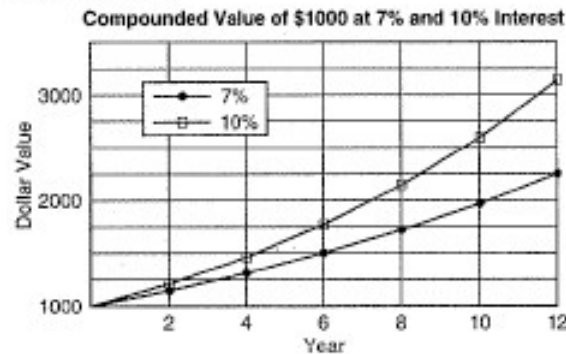
Histograms and other bar graphs are useful for showing comparisons, but sometimes the visual effect can be misleading. When viewing a graph, it is important to carefully note the scale. Compare these two bar graphs that display the same information.



2. Which of the two graphs visually exaggerates the growth in sales from one year to the next? How was the exaggerated visual effect created?
3. Larry made the bar graph below that compares his test score to Moe's test score. Create another bar graph that shows the same information in a less misleading way.



Changes over time are often displayed by line graphs. A **double-line graph** may compare two performances over time. The graph below illustrates the differences in the growing value of a \$1000 investment compounded at 7% and at 10% annual interest rates.



Math 8/7, Investigation 5

Sample taken from Math 8/7 (Third Edition), page 348

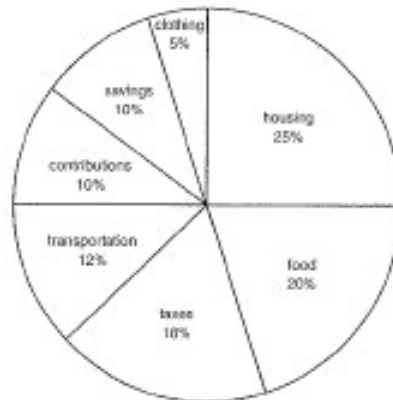
348 Saxon Math 8/7—Homeschool

4. Create a double-line graph using the information in the table below. Label the axes; then select and number the scales. Make a legend (or key) so that the reader can distinguish between the two graphed lines.

Stock Values (\$)

First Trade Of	XYZ Corp	ZYX Corp
1993	30	30
1994	36	28
1995	34	36
1996	46	40
1997	50	46
1998	50	42

A **circle graph** (or pie graph) is commonly used to show components of a budget. The entire circle, 100%, may represent monthly income. The sectors of the circle show how the income is allocated.



We see that the sector labeled “food” is 20% of the area of the circle, representing 20% of the income. To make a 20% sector, we could draw a central angle that measures 20% of 360° .

$$20\% \text{ of } 360^\circ$$

$$0.2 \times 360^\circ = 72^\circ$$

With a protractor we can draw a central angle of 72° to make a sector that is 20% of a circle.

Math 8/7, Investigation 5

Sample taken from Math 8/7 (Third Edition), page 349

5. Create a pie graph for the table below to show how Kerry spends a weekday. First calculate the number of degrees in the central angle for each sector of the pie graph. Next use a compass to draw a circle with a radius of about $2\frac{1}{2}$ inches. Then, with a protractor and straightedge, divide the circle into sectors of the correct size and label each sector.

How Kerry Spends a Day

Activity	% of Day
Studies	25%
Recreation	10%
Music lessons	10%
Eating	10%
Sleeping	40%
Other	5%

- Extensions**
- Create a circle graph showing the percentages of your friends and family with various eye colors.
 - Explore the graph-creating capabilities of database computer programs.

