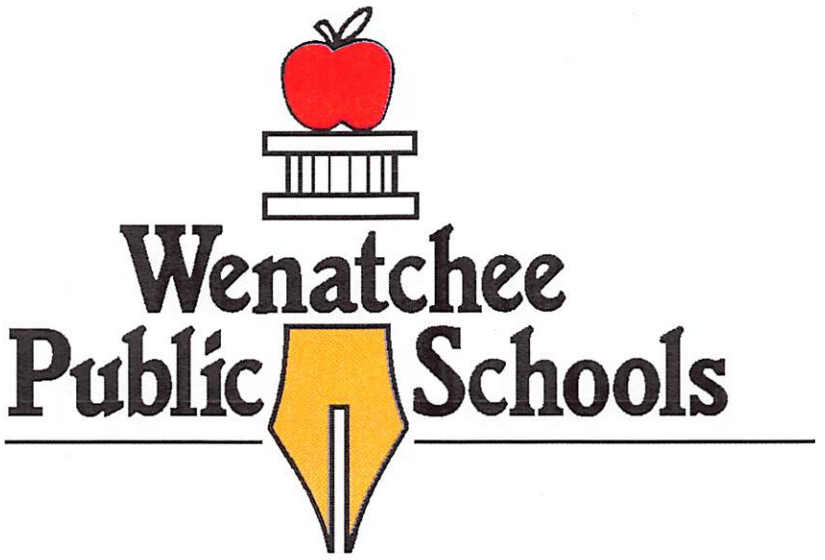


Optional Emergency Education Resources

Algebra I

Chapter 4 • Review Exercises

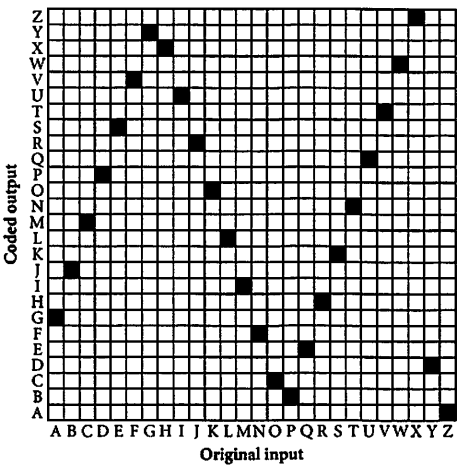
Name _____ Period _____ Date _____

1. *(Lesson 4.1)* Use the given coding grid to answer 1a–c.

a. Code the word ALGEBRA.

b. Decode the word KSMHSN.

c. Is this code a function? Explain why or why not.



2. *(Lesson 4.2)* Determine whether each of the following relationships represents a function. For each relationship that does represent a function, state the domain and range.

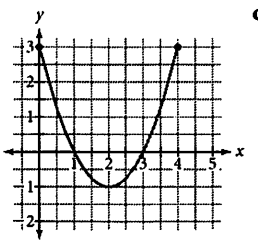
a.

Input x	Output y
2	10
7	9
3	8
2	7
8	6
7	5

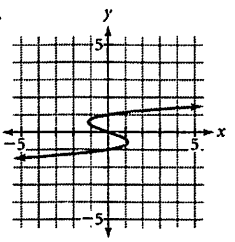
b.

Input x	Output y
1	1
3	2
5	3
8	2
2	3
7	4

c.



d.



3. *(Lessons 4.5)* Consider the line passing through the points (2, 4) and (5, −0.5).

a. Find the slope of the line.

b. Use the slope to find two other points on the line.

c. Write the equation of the line in point-slope form.

(continued)

4. *(Lesson 4.4)* Sid went for a drive, and after he started he decided to use his trip meter to keep track of the distance he had traveled. He collected the data shown in the table.

Time (h)	Distance (mi)
0.4	75.2
1.5	103.9
1.7	117.3
2.0	130.9
2.7	158.8
3.1	147.0
3.6	179.6
4.9	222.4
5.8	271.3

a. Plot the data on your calculator. Do the data look approximately linear?

b. Look at your scatter plot, and choose two points that seem to be representative of the slope of the data. Find the slope of the line passing through those two points. What is the real-world meaning of the slope in this situation?

c. Using the slope you found in 4b, adjust the y-intercept to find a line of fit for the data. What is the real-world meaning of the y-intercept in this situation?

d. Find a model for the data using linear regression. What is the correlation coefficient? Describe the correlation in terms of the problem situation.

5. *(Lesson 4.6)* Use the distributive property to write an equivalent equation in intercept form.

a. $y = 3 + 2(x + 1)$ b. $y = 1 + 3(x - 5)$ c. $y = -5 - (x - 8)$

6. *(Lesson 4.6)* Factor each expression so that the coefficient of x is 1.

a. $4x - 36$ b. $-2x + 10$ c. $-3x - 15$ d. $2x + 7$

7. (*Lessons 4.8*) Consider the following data set.

x	1.0	1.7	2.3	3.2	3.5	4.1	4.9	6.2	7.1	7.4
y	35	31	31	28	27	24	25	17	20	18

a. Find the five-number summaries for the x-values and the y-values.

b. Create a scatter plot of the data, and determine which Q-points should be used to model this data.

c. Find the line of fit based on Q-points for the data. Add the graph of this line to your graph for 5b.

SOLUTIONS TO CHAPTER 4 REVIEW EXERCISES

1. a. Find each letter on the bottom of the grid, and go up the column to a shaded square. Then go to the left of the square to find the coded letter. ALGEBRA codes into GLYSJHG.

b. Find each coded letter on the left of the grid, and go across the row to a shaded square. Then go down from the square to find the input letter. KSMHSN decodes into SECRET.

c. Yes, it is a function. Each input letter is assigned to only one coded letter. That is, there is only one shaded square in each column.

2. The domain is the set of all possible input values, or x-values; and the range is the set of all possible output values, or y-values.

a. Not a function. The x-value 2 corresponds to two different y-values, 10 and 7.

b. This is a function. Each x-value corresponds to only one y-value. Domain: $\{1, 2, 3, 5, 7, 8\}$; Range: $\{1, 2, 3, 4\}$.

c. This is a function. Each x-value corresponds to only one y-value. Any vertical line crosses the graph of the function only once. Domain: $0 \le x \le 4$; Range: $-1 \le y \le 3$.

d. Not a function. The value $x = 0$ corresponds to more than one y-value. A vertical line through 0 crosses the graph of the function more than once.

3. a. -1.5. To find the slope, divide the difference in y-values by the difference in x-values.

$$\frac{-0.5 - 4}{5 - 2} = \frac{-4.5}{3} = -1.5$$

b. Answers will vary. Sample answer: Start with the point $(2, 4)$; add 1.5 to the y-value and subtract 1 from the x-value. Repeat this process with the new point you obtain. The resulting points are $(1, 5.5)$ and $(0, 7)$.

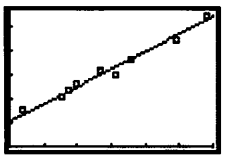
c. Answers will vary. Using the point $(2, 4)$, the equation is $y = 4 - 1.5(x - 2)$. Using the point $(5, -0.5)$, the equation is $y = -0.5 - 1.5(x - 5)$.

4. a. Yes, the data look approximately linear. See the solution for 4c.

b. Answers will vary. Using the first point and the last point, you get a slope of approximately 36.3. The slope is Sid's average speed in mi/h.

c. Answers will vary. The line $y = 52.2 + 36.3x$ appears to be a good fit. The y-intercept is an estimate for the reading on the trip meter when Sid started timing his trip.

d. A linear regression gives a model of $y = 55.6 + 35.2x$ with a correlation coefficient of 0.989. There is a strong, positive correlation between the time spent driving and the distance traveled.



[0, 6, 1, 0, 280, 50]

5. a.

$y = 3 + 2(x) + 2(1)$	Use the distributive property.
$y = 3 + 2x + 2$	Multiply.
$y = 5 + 2x$	Add.

b.

$y = 1 + 3(x) + 3(-5)$	Use the distributive property.
$y = 1 + 3x + -15$	Multiply.
$y = -14 + 3x$	Add.

c.

$y = -5 - 1(x) - 1(-8)$	Use the distributive property.
$y = -5 - x + 8$	Multiply.
$y = 3 - x$	Add.

6. a.

$4x - 36 = 4(x) - 4(9)$	Factor 4 out of each term.
$= 4(x - 9)$	Factor.

b.

$-2x + 10 = -2(x) + -2(-5)$	Factor -2 out of each term.
$= -2(x - 5)$	Factor.

c.

$-3x - 15 = -3(x) + -3(5)$	Factor -3 out of each term.
$= -3(x + 5)$	Factor.

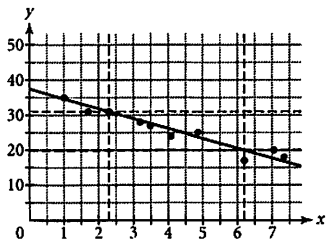
d.

$2x + 7 = 2(x) + 2(3.5)$	Factor 2 out of each term.
$= 2(x + 3.5)$	Factor.

(continued)

7. a. 1.0, 2.3, 3.8, 6.2, 7.4; 17, 20, 26, 31, 35. See solution to Chapter 1 Exercise 2c in this guide for help in finding five-number summaries.

b. The Q-points you should use are (2.3, 31) and (6.2, 20). To find the Q-points, graph vertical lines extending from the Q_1- and Q_3-values for the x-values 2.3 and 6.2, and graph horizontal lines extending from the Q_1- and Q_3-values for the y-values 20 and 31. This will create a rectangular box. The Q-points are the corners of the box. Use the two Q-points that create the best line of fit for the data, in this case (2.3, 31) and (6.2, 20).



c. The slope of the line is $\frac{20-31}{6.2-2.3} = -\frac{11}{3.9} \approx -2.82$. Use the point-slope form of the equation, with the slope and either of the two Q-points found in 7b. The equation is $y = 31 - 2.82(x - 2.3)$ or $y = 20 - 2.82(x - 6.2)$.

Chapter 5 • Review Exercises

Name _____ Period _____ Date _____

1. *(Lesson 5.1)* Determine whether the ordered pair is a solution to the system of equations. Graph both lines in the system, and plot the point.

   a. $(1, -2)\begin{cases} y = 2x - 4 \\ y = -x - 1 \end{cases}$

   b. $(3, 1)\begin{cases} y = -\frac{2}{3}x + 3 \\ y = \frac{2}{3}x - 2 \end{cases}$

2. *(Lesson 5.3)* Solve this system of equations using the substitution method, and then check your answer.

   $\begin{cases} 2x + 3y = 7 \\ x - 4y = -2 \end{cases}$

3. *(Lesson 5.4)* Solve this system by elimination, and then check your work.

   $\begin{cases} 2x - 3y = -2 \\ 5x + 2y = -5 \end{cases}$

4. *(Lessons 5.1–5.4)* Jenna purchased peaches and pears at the local market. The peaches cost \$2.90 per pound, and the pears cost \$1.10 per pound. Jenna bought a total of 8 pounds of fruit, which cost \$18.34. How many pounds of each fruit did Jenna buy?

5. *(Lesson 5.5)* Solve the inequality $3 - 5x \geq 8$ and graph the solutions on a number line.

6. *(Lessons 5.6, 5.7)* Consider the system of inequalities $\begin{cases} y < 2x - 3 \\ y \geq -x + 1 \end{cases}$.

   a. Determine whether each of the following ordered pairs is a solution to this system of inequalities.

      i. $(0, 2)$ ii. $(4, 2)$ iii. $(-3, 1)$ iv. $(3, -2)$

   b. Graph the system of inequalities, and plot each of the points from 6a.

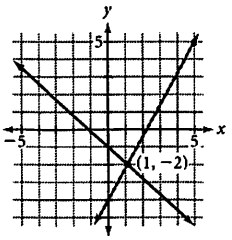
SOLUTIONS TO CHAPTER 5 REVIEW EXERCISES

1. a. Yes. The ordered pair $(1, -2)$ satisfies both equations.

$y = 2x - 4$ $\qquad$ $y = -x - 1$

$-2 \stackrel{?}{=} 2(1) - 4$ $\qquad$ $-2 \stackrel{?}{=} -1 - 1$

$-2 = -2$ $\qquad$ $-2 = -2$



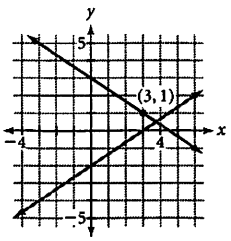
b. No. The ordered pair $(3, 1)$ does not satisfy the second equation.

$y = -\frac{2}{3}x + 3$ $\qquad$ $y = \frac{2}{3}x - 2$

$1 \stackrel{?}{=} -\frac{2}{3}(3) + 3$ $\qquad$ $1 \stackrel{?}{=} \frac{2}{3}(3) - 2$

$1 \stackrel{?}{=} -2 + 3$ $\qquad$ $1 \stackrel{?}{=} 2 - 2$

$1 = 1$ $\qquad$ $1 \neq 0$



2. $(2, 1)$. Solve the second equation for x, and substitute the expression into the first equation.

$x - 4y = -2$	Second equation.
$x = 4y - 2$	Add $4y$ to both sides.
$2(4y - 2) + 3y = 7$	Substitute $4y - 2$ for x in the first equation.
$8y - 4 + 3y = 7$	Use the distributive property.
$11y - 4 = 7$	Combine like terms.
$11y = 11$	Add 4 to both sides.
$y = 1$	Divide both sides by 11.

Substitute 1 for y into one of the original equations and solve for x: $x - 4(1) = -2$; $x = 2$. The solution is $(2, 1)$.

Check your solution.

$2x + 3y = 7$ $\qquad$ $x - 4y = -2$

$2(2) + 3(1) \stackrel{?}{=} 7$ $\qquad$ $2 - 4(1) \stackrel{?}{=} -2$

$7 = 7$ $\qquad$ $-2 = -2$

3. $(-1, 0)$

$2(2x - 3y) = 2(-2) \rightarrow 4x - 6y = -4$	Multiply both sides by 2.
$3(5x + 2y) = 3(-5) \rightarrow 15x + 6y = -15$	Multiply both sides by 3.
$19x = -19$	Add the equations.
$x = -1$	Divide both sides by 19.

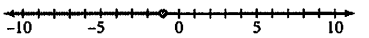
Substitute this x-value into either of the original equations and solve to find y. Using the first equation, $2(-1) - 3y = -2$; $y = 0$.

Check your solution in both equations.

4. 5.3 lb of peaches, 2.7 lb of pears. Let x be the number of pounds of peaches, and y be the number of pounds of pears Jenna bought. Adding up pounds yields the equation $x + y = 8$, and adding up cost yields the equation $2.90x + 1.10y = 18.34$. This system may be more easily solved by substitution.

5.

$3 - 5x \geq 8$	Original inequality.
$-5x \geq 5$	Subtract 3 from both sides.
$x \leq -1$	Divide both sides by -5 and reverse the inequality.



6. a. Substitute the values for x and y into each inequality and see whether a true statement results.

i. No. The ordered pair satisfies the second inequality but not the first.

ii. Yes. The ordered pair satisfies both inequalities.

iii. No. the ordered pair does not satisfy either inequality.

iv. Yes. The ordered pair satisfies both inequalities.

b. Begin by graphing the equations $y = 2x - 3$ and $y = 1 - x$. Because the first inequality has $<$ instead of $\leq$, the line $y = 2x - 3$ should be dashed to indicate that it is not included in the solution. The other line should be solid. Plot the points and shade the area containing the solutions.