

Name _____

Mid-Term Exam Wednesday January 16th

8th Grade Mid-Term

Chapter 1: Equations

Chapter 5 (7th Grade Extension): Slope and Direct Variation

Chapter 4: Linear Equations

Chapter 5: Systems of Equations

Chapter 6: Functions

Work out solutions for each Chapter Test on separate paper. You will need graph paper! Title each review with the Chapter Name. You will turn in all review work on the day of the Mid-Term Exam.

1 Chapter Test

Check It Out
Test Practice
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Solve the equation. Check your solution, if possible.

1. $4 + y = 9.5$

2. $-\frac{x}{9} = -8$

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

4. $3.8n - 13 = 1.4n + 5$

5. $9(8d - 5) + 13 = 12d - 2$

6. $9j - 8 = 8 + 9j$

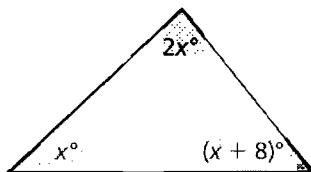
7. $2.5(2p + 5) = 5p + 12.5$

8. $\frac{3}{4}t + \frac{1}{8} = \frac{3}{4}(t + 8)$

9. $\frac{1}{7}(14r + 28) = 2(r + 2)$

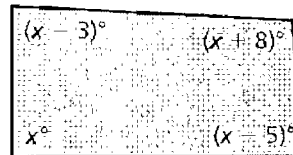
Find the value of x . Then find the angle measures of the polygon.

10.



Sum of angle measures: 180°

11.



Sum of angle measures: 360°

Solve the equation for y .

12. $1.2x - 4y = 28$

13. $0.5 = 0.4y - 0.25x$

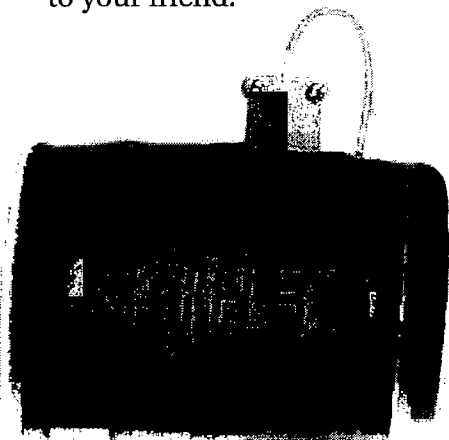
Solve the formula for the red variable.

14. Perimeter of a rectangle: $P = 2\ell + 2w$

15. Distance formula: $d = rt$

16. **BASKETBALL** Your basketball team wins a game by 13 points. The opposing team scores 72 points. Explain how to find your team's score.

17. **CYCLING** You are biking at a speed of 18 miles per hour. You are 3 miles behind your friend, who is biking at a speed of 12 miles per hour. Write and solve an equation to find the amount of time it takes for you to catch up to your friend.



18. **VOLCANOES** Two scientists are measuring lava temperatures. One scientist records a temperature of 1725°F . The other scientist records a temperature of 950°C . Which is the greater temperature? (Use $C = \frac{5}{9}(F - 32)$.)

19. **JOBS** Your profit for mowing lawns this week is \$24. You are paid \$8 per hour and you paid \$40 for gas for the lawn mower. How many hours did you work this week?

5.4–5.6 Quiz

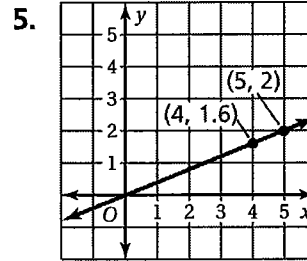
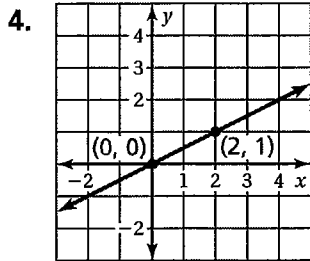
Solve the proportion. (Section 5.4)

1. $\frac{7}{n} = \frac{42}{48}$

2. $\frac{x}{2} = \frac{40}{16}$

3. $\frac{3}{11} = \frac{27}{z}$

Find the slope of the line. (Section 5.5)



Graph the data. Then find and interpret the slope of the line through the points. (Section 5.5)

6.

Hours, x	2	4	6	8
Miles, y	10	20	30	40

7.

Packages, x	6	10	14	18
Servings, y	9	15	21	27

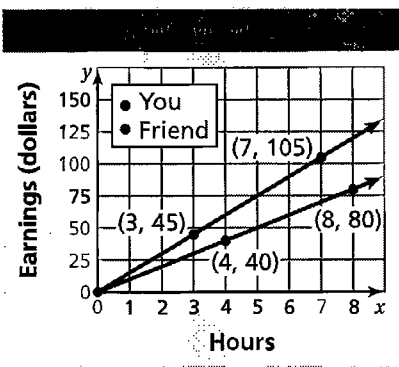
Tell whether x and y show direct variation. Explain your reasoning. (Section 5.6)

8. $y - 9 = 6 + x$

9. $x = \frac{5}{8}y$

10. **CONCERT** A benefit concert with three performers lasts 8 hours. At this rate, how many hours is a concert with four performers? (Section 5.4)

11. **LAWN MOWING** The graph shows how much you and your friend each earn mowing lawns. (Section 5.5)



- Compare the steepness of the lines. What does this mean in the context of the problem?
- Find and interpret the slope of each line.
- How much more money do you earn per hour than your friend?

12. **PIE SALE** The table shows the profits of a pie sale. Tell whether x and y show direct variation. If so, write the equation of direct variation. (Section 5.6)

	10	12	14	16
	\$79.50	\$95.40	\$111.30	\$127.20



4 Chapter Test

Find the slope and the y -intercept of the graph of the linear equation.

1. $y = 6x - 5$

2. $y = 20x + 15$

3. $y = -5x - 16$

4. $y - 1 = 3x + 8.4$

5. $y + 4.3 = 0.1x$

6. $-\frac{1}{2}x + 2y = 7$

Graph the linear equation.

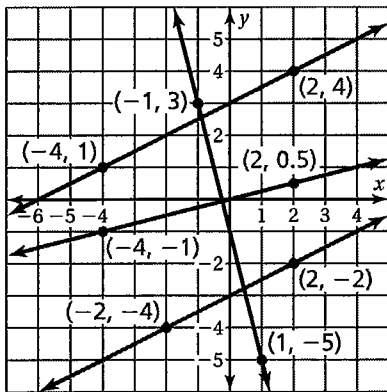
7. $y = 2x + 4$

8. $y = -\frac{1}{2}x - 5$

9. $-3x + 6y = 12$

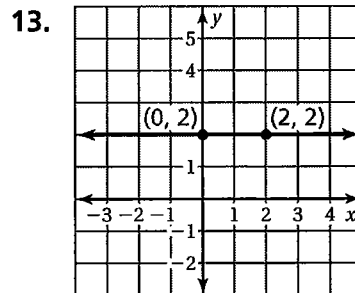
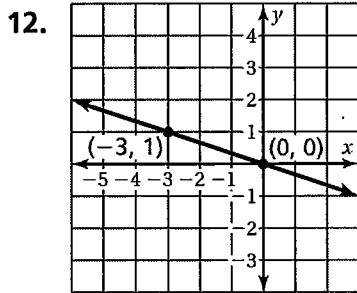
10. Which lines are parallel? Which lines are perpendicular? Explain.

11. The points in the table lie on a line. Find the slope of the line.



x	y
-1	-4
0	-1
1	2
2	5

Write an equation of the line in slope-intercept form.



Write in slope-intercept form an equation of the line that passes through the given points.

14. $(-1, 5), (3, -3)$

15. $(-4, 1), (4, 3)$

16. $(-2, 5), (-1, 1)$

17. **VOCABULARY** The number y of new vocabulary words that you learn after x weeks is represented by the equation $y = 15x$.

- Graph the equation and interpret the slope.
- How many new vocabulary words do you learn after 5 weeks?
- How many more vocabulary words do you learn after 6 weeks than after 4 weeks?



Solve the system of linear equations by graphing.

1. $y = 4 - x$

$y = x - 4$

2. $y = \frac{1}{2}x + 10$

$y = 4x - 4$

3. $y + x = 0$

$3y + 6x = -9$

Solve the system of linear equations by substitution. Check your solution.

4. $-3x + y = 2$

$-x + y - 4 = 0$

5. $x + y = 20$

$y = 2x - 1$

6. $x - y = 3$

$x + 2y = -6$

Solve the system of linear equations by elimination. Check your solution.

7. $2x + y = 3$

$x - y = 3$

8. $x + y = 12$

$3x = 2y + 6$

9. $-2x + y + 3 = 0$

$3x + 4y = -1$

Without graphing, determine whether the system of linear equations has *one solution*, *infinitely many solutions*, or *no solution*. Explain your reasoning.

10. $y = 4x + 8$

$y = 5x + 1$

11. $2y = 16x - 2$

$y = 8x - 1$

12. $y = -3x + 2$

$6x + 2y = 10$

Use a graph to solve the equation. Check your solution.

13. $\frac{1}{4}x - 4 = \frac{3}{4}x + 2$

14. $8x - 14 = -2x - 4$

15. **FRUIT** The price of 2 pears and 6 apples is \$14. The price of 3 pears and 9 apples is \$21. Can you determine the unit prices for pears and apples? Explain.

16. **BOUQUET** A bouquet of lilies and tulips has 12 flowers. Lilies cost \$3 each, and tulips cost \$2 each. The bouquet costs \$32. Write and solve a system of linear equations to find the number of lilies and tulips in the bouquet.

GUEST CHECK

4 Specials
2 Glasses of milk
\$28.00

GUEST CHECK

5 Specials
4 Glasses of milk
\$26.25

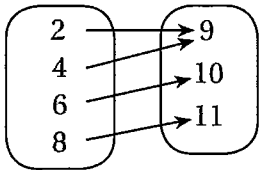
17. **DINNER** How much does it cost for 2 specials and 2 glasses of milk?



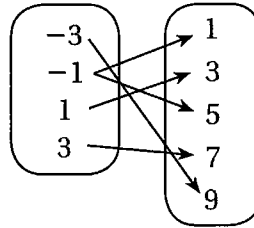
6 Chapter Test

Determine whether the relation is a function.

1. Input Output



2. Input Output



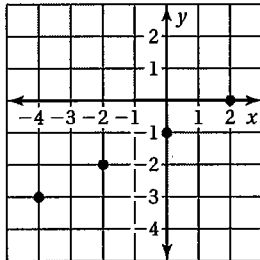
Graph the function.

3. $y = x + 8$

4. $y = 1 - 3x$

5. $y = x - 4$

6. Use the graph to write a linear function that relates y to x .



7. Does the table represent a *linear* or *nonlinear* function? Explain.

x	0	2	4	6
y	8	0	-8	-16

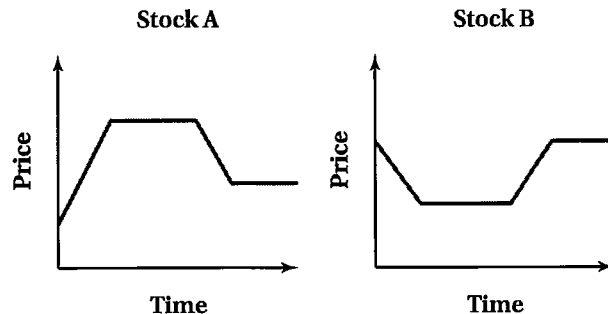
8. **WATER SKI** The table shows the number of meters a water skier travels in x minutes.

Minutes, x	1	2	3	4	5
Meters, y	600	1200	1800	2400	3000

- Write a function that relates x to y .
- Graph the linear function.
- At this rate, how many *kilometers* would the water skier travel in 12 minutes?

9. **STOCKS** The graphs show the prices of two stocks during one day.

- Describe the prices of each stock.
- Make three comparisons from the graphs.



10. **RACE** You are competing in a race. You begin the race by increasing your speed at a constant rate. You then run at a constant speed until you get a cramp and have to stop. You wait until your cramp goes away before you start gradually increasing your speed again at a constant rate. Sketch a graph that represents the situation.