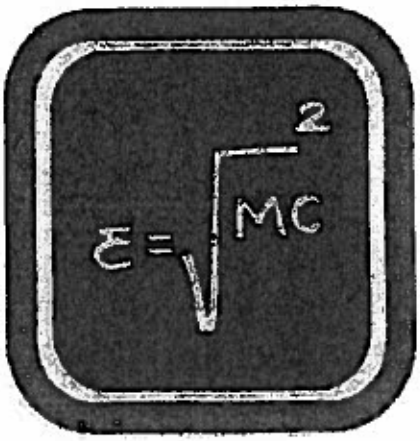
8th Grade Summer Advanced Math Packet



Your Summer Math Packet is attached. Please complete each page and show your work either on the page itself or attached on a clearly labeled piece of looseleaf. The packet must be returned to your math teacher on the first day of school in September.

You may use the following website as helpful guides:

www.khanacademy.org

www.homeworkspot.com/middle/math

www.mathvids.com/level/show/3-middle-school-math

Name _____ Date _____ Class _____

End of Course Test

Select the best answer.

1. Which of the following is a correct statement?

   A $0.03 > 30\%$ C $0.30 < \frac{3}{10}$

   B $0.03 = \frac{3}{10}$ D $30\% = \frac{3}{10}$

2. Valleywood Golf Course offers classes Monday through Saturday. The Saturday classes last 75 minutes while the weekday classes last 45 minutes. If they offered 705 minutes of classes last week, what was the maximum number of weekday classes?

   F 9 H 12

   G 14 J 17

3. Find the area of a trapezoid with the dimensions $b_1 = 9$, $b_2 = 16$, $h = 13.4$.

   A 335 sq units

   B 223.4 sq units

   C 189.2 sq units

   D 167.5 sq units

4. A car salesman makes $445 per week plus commission. If during the week he sells a new van for $34,960 and earns a 2.5% commission on the sale, how much money did he earn for the week?

   F $429 H $885

   G $874 J $1319

5. What is the value of $f(-3)$ for the function $f(x) = 4.7x + 1.6$?

   A −18.3 C −12.5

   B −15.7 D 15.7

6. If $\angle A$ and $\angle B$ are supplementary, and $m\angle A = 57°$, what is $m\angle B$?

   F 33° H 213°

   G 123° J 303°

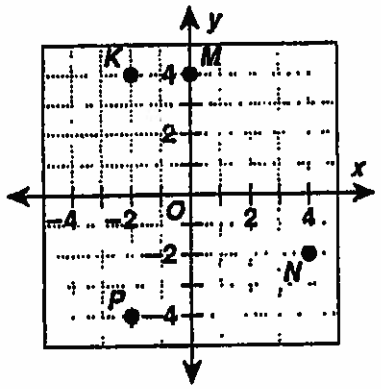
7. At a school festival, a colored chip is randomly drawn out of a bag, and replaced. The table below shows the results of 50 draws. Estimate the probability of choosing a purple chip.

Outcome	Blue	Red	Green	Purple	Gold
Draws	7	11	6	12	14

   A 12% C 24%

   B 18% D 88%

8. What are the coordinates of point K?



   F (−2, 4) H (2, −4)

   G (−2, −4) J (2, 4)

9. Solve $\frac{4}{5}k + \frac{7}{10} = \frac{13}{15}k - \frac{3}{5}$.

   A $k = \frac{1}{10}$ C $k = 19\frac{1}{2}$

   B $k = 1\frac{1}{2}$ D $k = 21\frac{2}{5}$

Name _____ Date _____ Class _____

End of Course Test

10. What is the slope of a line that is perpendicular to the line that passes through the points (4, 7) and (9, 3)?

F $-\frac{4}{5}$ H $\frac{4}{5}$

G $-\frac{5}{4}$ J $\frac{5}{4}$

11. Evaluate $\frac{3+k+9}{2}$ for $k = -16$.

A -2 C -4

B 2 D 14

12. In a school survey, three homerooms are chosen and ten students from each homeroom are randomly chosen to complete the survey. Identify the sampling method.

F convenience H systematic

G random J stratified

13. Give the 8th term in the sequence if the numerator of each fraction is 1.

$6\frac{1}{6}, 6\frac{1}{3}, 6\frac{1}{2}, \ldots$

A $6\frac{2}{3}$ C 7

B $6\frac{5}{6}$ D $7\frac{1}{3}$

14. On a drawing with a scale of $\frac{1}{8}$ in.: 1 ft, a window is $\frac{3}{4}$ in. wide. What is the actual width of the window?

F 5.5 ft H 6 ft

G 5.75 ft J 6.25 ft

15. What is the equation of direct variation given that y is 16 when x is -2?

A $y = -8x$ C $y = 8x$

B $y = -\frac{1}{8}x$ D $x = -8y$

16. The graph represents which inequality?

F $y \leq x + 4$ H $y < x + 4$

G $y = 4x$ J $y > x + 4$

17. Combine like terms:

$7a + 4b - 3a - 2b$

A $4a + 2b$ C $4a - 2b$

B $11a - b$ D $7ab$

18. Find the mean, median, and mode of the data set. 5, 8, 6, 5, 8, 4, 8, 4

F 6, 5.5, 8 H 8, 5.5, 8

G 5.5, 6, 6 J 6, 5.5, 5

19. Simplify $19 + (3 \cdot 2^4)$.

A 38 C 912

B 67 D 1315

20. Between what two integers does $\sqrt{429}$ lie?

F 8 and 9 H 15 and 16

G 20 and 21 J 12 and 13

21. When starting a family vacation, the Singler's odometer in their van read 15,674.7. At the end of the trip the odometer read 16,495.2. How far did the Singlers travel?

A 32,169.9 mi C 820.5 mi

B 1117.2 mi D -820.5 mi

Name _____ Date _____ Class _____

End of Course Test

22. Caleb and Drew are playing a game with a pair of dice. Caleb needs a sum of 5 or greater to win. What is the probability of Caleb winning on his next turn?

F $\frac{5}{6}$ H $\frac{1}{6}$

G $\frac{2}{5}$ J $\frac{2}{3}$

23. Wesley invested $6500 in a mutual fund at a yearly rate of $3\frac{3}{4}\%$. If he has earned $975 in interest, how long has the money been invested?

A 2.5 years C 4 years

B 3 years D 4.5 years

24. If a pool table measures 4 ft by 8 ft, what is the diagonal length from the back edge of the top left pocket to the bottom right pocket to the nearest tenth?

F 80 ft H 6.9 ft

G 24.3 ft J 8.9 ft

25. What is the sum of the interior angles of a hexagon?

A 180° C 540°

B 360° D 720°

26. Evaluate $2x + 5y$ for $x = 12$ and $y = 6$.

F 72 H 54

G 25 J 42

27. Solve $\frac{3}{18} = \frac{a}{30}$.

A 6 C 15

B 5 D 90

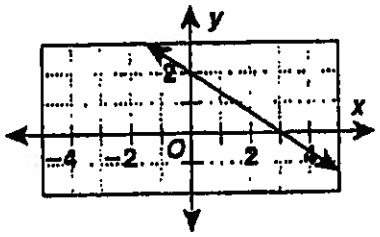
28. Your favorite brand of cereal comes in four different sized boxes. Which size is the lowest unit rate?

Toasted Almond Crunch	
15 oz	$2.39
18 oz	$2.87
24 oz	$3.79
32 oz	$5.10

F 15 oz H 24 oz

G 18 oz J 32 oz

29. The line has what type of slope?



A positive C zero

B negative D undefined

30. Which is the number 0.0000042 in scientific notation?

F 0.42×10^{-7} H 4.2×10^{-6}

G 4.2×10^{6} J 4.2×10^{-5}

31. Which ordered pair is a solution of the system of equations?
$y = 3x + 1$
$y = 5x - 3$

A (2, 3) C (1, 2)

B (0, 1) D (2, 7)

Name _____ Date _____ Class _____

End of Course Test

32. For a graduation party Mrs. Kennedy prepares a meat tray. If she buys 3 pounds each of ham and turkey, 2 pounds of roast beef, and 1 pound of salami, how much will the meat cost?

Today's Specials	
Roast Beef	$6.29 lb
Ham	$3.29 lb
Salami	$3.89 lb
Turkey	$4.79 lb

F $18.26 H $40.71

G $31.13 J $47.26

33. If Hannah purchased a 5-day parking pass for $36.25, how much did she pay per day?

A $6.75 C $7.00

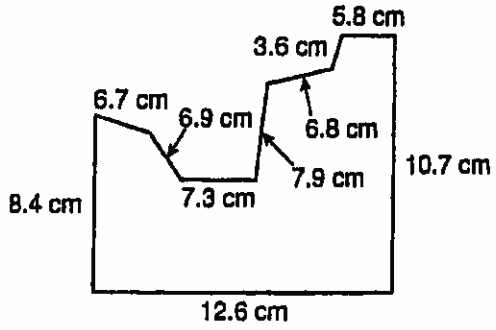
B $6.85 D $7.25

34. A school festival has sold 760 tickets. If this is 95% of their goal, how many more tickets do they need to sell to reach 100% of their goal?

F 22 H 58

G 40 J 800

35. Find the perimeter of the figure.



A 69.8 cm C 73.1 cm

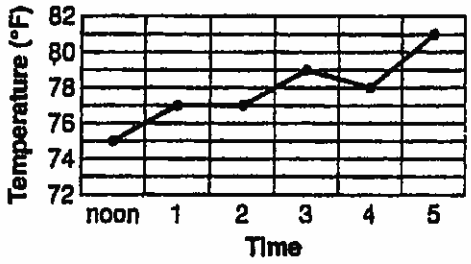
B 70 cm D 76.7 cm

36. Jasmin is walking a group of 6 dogs. In how many different orders can the dogs enter her house in single file to get a drink of water?

F 21 H 480

G 40 J 720

37. How many times did the temperature rise one degree per hour?



A none C 2

B 1 D 3

38. Give the 9th term in the sequence 2, –6, 18, –54 . . .

F –39,366 H 1459

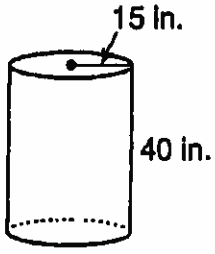
G –4374 J 13,122

39. What is the range and the first and third quartiles of the data set?
14, 16, 12, 15, 22, 18, 16, 10, 12

A 22, 12, 17 C 12, 12, 17

B 22, 15, 17 D 12, 12, 15

40. Find the volume. Use 3.14 for π.



F 1200 in^3

G 1884 in^3

H 3768 in^3

J 28,260 in^3

Name _____ Date _____ Class _____

CHAPTER **Cum lative Test**

Choose the best answer.

1. Which is the algebraic expression for the word phrase 5 *less than the product of* 8 *and* p?

   A $5 - 8p$ C $5p - 8$

   B $8p - 5$ D $p + 8 - 5$

2. Find the solution for $x - 26 = 78$.

   F $x = 3$ H $x = 104$

   G $x = 52$ J $x = 2{,}028$

3. Evaluate $w - (-17)$ for $w = 8$.

   A -25 C 9

   B -9 D 25

4. Evaluate $(-8)^2$.

   F -64 H 16

   G -16 J 64

5. What is 0.125 as a fraction in simplest form?

   A $\frac{1}{125}$ C $\frac{1}{8}$

   B $\frac{1}{80}$ D $1\frac{1}{4}$

6. Add 6.85 + 3.3.

   F 10.15 H 8.88

   G 9.88 J 7.18

7. Divide $16 \div 2\frac{2}{3}$.

   A 6 C $13\frac{1}{3}$

   B 12 D $42\frac{2}{3}$

8. What is $\sqrt{176}$ rounded to the nearest tenth?

   F 13 H 13.3

   G 13.2 J 14

For 9–10, use the stem-and-leaf plot, which shows the points scored by a middle-school football team during the season.

Football Point Scored

Stems	Leaves
0	3 7 7 7
1	2 3 4 4 9
2	1 4

9. What is the mode of the scores?

   A 7 C 12.8

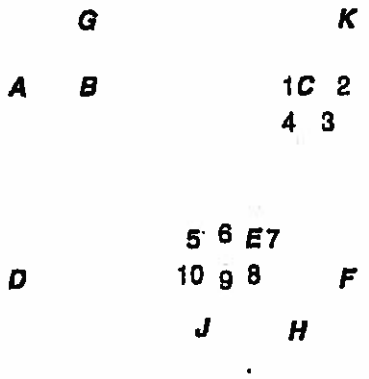
   B 11 D 13

10. What is the third quartile?

    F 14 H 21

    G 19 J 24

Use the figure for 11 and 12.



11. Which angle is supplementary to $\angle ABE$?

    A $\angle GBC$ C $\angle EBC$

    B $\angle BCE$ D $\angle DEJ$

12. Line AC is parallel to line DF. If $m\angle DEC$ is 150°, what is $m\angle 1$?

    F 210° H 150°

    G 180° J 30°

Name _____ Date _____ Class _____

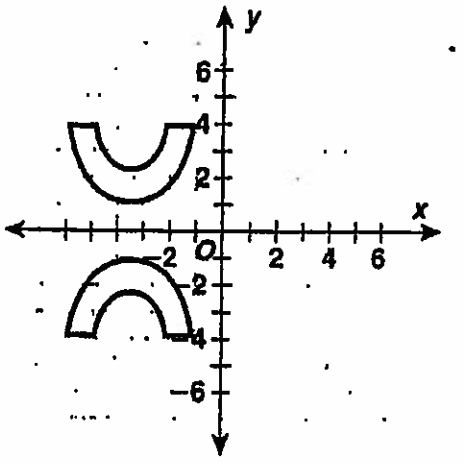
CHAPTER **Cumulative Test**

13. What is the sum of the measures of the angles of an octagon?

A 180° C 1,440°

B 1,080° D 1,800°

14. Identify the type of transformation.



F translation H reflection

G dilation J tessellation

15. What is the area of a figure with vertices (1, 1), (8, 1), and (5, 5)?

A 28 square units

B 21 square units

C 14 square units

D 11 square units

16. A tree trunk has a radius of 11 inches. What is the circumference of the tree trunk to the nearest tenth? Use 3.14 for π.

F 34.5 in. H 138.2 in.

G 69.1 in. J 379.9 in.

17. The base of a cone has a radius of 6 centimeters. The cone is 7 centimeters tall. What is the volume of the cone to the nearest tenth? Use 3.14 for π.

A 260 cm^3 C 263.8 cm^3

B 263.7 cm^3 D 264.0 cm^3

18. Which is the best buy?

F an 8-oz can of peaches for $0.59

G a 12-oz can of peaches for $0.89

H a 20-oz can of peaches for $1.49

J a 32-oz can of peaches for $2.29

19. Solve the proportion $\frac{5}{8} = \frac{a}{20}$.

A $a = 2.5$ C $a = 15$

B $a = 12.5$ D $a = 17$

20. Which scale enlarges the size of the actual object?

F 1 m to 100 cm H 1 cm to 10 m

G 10 mm to 1 cm J 10 m to 1 cm

21. Alyssa is selling bags of peanuts to raise money for a fundraiser. So far, she has sold 36 bags of peanuts. This is 45% of her goal. What is Alyssa's goal?

A 16 bags of peanuts

B 52 bags of peanuts

C 80 bags of peanuts

D 81 bags of peanuts

6-4 Slope of a Line

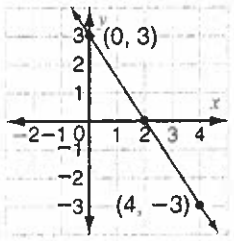
Name _____ Date _____

Find the slope of the line.

Points:

$P_1(x_1, y_1) = (0, 3)$

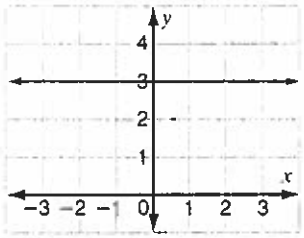
$P_2(x_2, y_2) = (4, -3)$



$$\text{slope } (m) = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}} = \frac{-3 - 3}{4 - 0} = \frac{-6}{4} = -\frac{3}{2}$$

So the slope of the line is $-\frac{3}{2}$.

Classify the slope of the line.



The line is horizontal, so it has a slope of zero.

Remember: The slope of a line is positive if it rises from left to right, negative if it falls from left to right, and undefined, or no slope, if it is a vertical line.

Find the slope of the line given a pair of coordinates: (4, −1), (−2, −3)

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(-3) - (-1)}{-2 - 4} = \frac{-2}{-6} = \frac{1}{3}$$

So the slope of the line is $\frac{1}{3}$.

Find the slope of the line that passes through each pair of points.

1. (2, 5) and (6, 8)
$\frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 5}{6 - 2} = \frac{3}{4}$

2. (−3, 7) and (4, −5) _____

3. (0, 7) and (14, 0) _____

4. (−1, −8) and (9, 2) _____

5. (0, 0) and (8, 16) _____

6. (0, 0) and (−1, 6) _____

7. (5, 2) and (−3, 1) _____

8. (1, −6) and (−6, −9) _____

9. (2, −4) and (3, 2) _____

10. (3, −2) and (−2, 6) _____

11. (−3, 7) and (5, 7) _____

12. (0, −2) and (−1, 5) _____

13. (1, −2) and (3, −4) _____

14. (1, 3) and (−2, 9) _____

15. (3, 5) and (3, 1) _____

16. (−8, −2) and (−6, −4) _____

Find the slope of the line that contains each pair of points. Then graph the line.

17. (0, −9) and (3, 0)
$\frac{0 - (-9)}{3 - 0} = \frac{9}{3} = 3$

18. (0, −4) and (16, 0) _____

19. (0, 9) and (0, 4) _____

20. (0, −4) and (12, 0) _____

21. (9, 17) and (−1, −3) _____

22. (0.5, 2) and (2.5, 10) _____

23. (−1.5, 5) and (6, 5) _____

24. (1.5, 2.5) and (0.5, 3.5) _____

Practice Chapter 6 Test

Name _____ Date _____

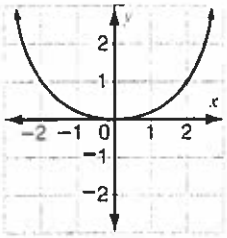
Tell whether each relation is a function. Write *function* or *not a function*.

1.

Input (x)	1	1	2	2
Output (y)	2	−2	4	−4

_____

2.



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Write a function rule for each table.

3.

Input x	−3	−2	−1	0	1	2	3
Output y	3	4	5	6	7	8	9

_____

4.

Input x	−3	−2	−1	0	1	2	3
Output y	−4	−2	0	2	4	6	8

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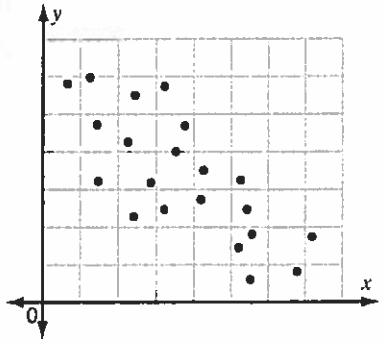
Draw a line of best fit to determine whether the correlation is positive, negative, or neither.

5.



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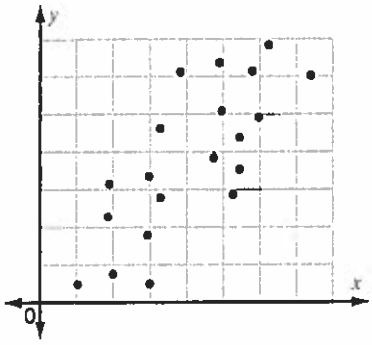
6.



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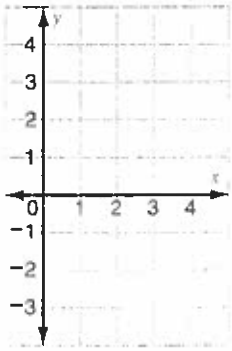
Describe each boundary line as *solid* or *dashed*. Graph the solution set.

7. $3x + y \geq 4$



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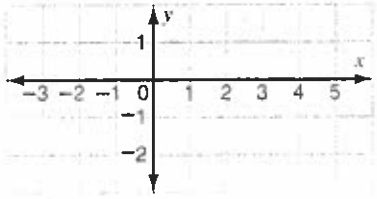
8. $2x - 5y > 5$



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7-2 Proportions

Name _____ Date _____

A *proportion* is an equation that shows two ratios or rates are equal.

Cross-Products Rule: Two ratios form a proportion if their cross products are equal.

$\frac{0.3}{0.4} \times \frac{0.6}{0.8}$

$0.3 \cdot 0.8 \stackrel{?}{=} 0.4 \cdot 0.6$ ← Multiply the extremes and the means.

$0.24 = 0.24$

So $\frac{0.3}{0.4} = \frac{0.6}{0.8}$ is a proportion.

Use the *Cross-Products Rule* to find the missing term in a proportion.

$\frac{\frac{1}{2}}{a} = \frac{\frac{1}{3}}{12}$ $\quad \frac{\frac{1}{2}}{a} \times \frac{\frac{1}{3}}{12}$

$\frac{1}{2} \cdot 12 = \frac{1}{3} \cdot a$ ← Multiply the extremes and the means.

$\frac{6}{\frac{1}{3}} = \frac{\frac{1}{3}a}{\frac{1}{3}}$ ← Divide each side by one third.

$18 = a$

So $\frac{\frac{1}{2}}{18} = \frac{\frac{1}{3}}{12}$.

Determine if each set of ratios forms a proportion. Write = or ≠. Justify your answer.

1. $\frac{7}{9}$ ___ $\frac{21}{27}$

$7 \cdot 27 \stackrel{?}{=} 9 \cdot 21$

$189 = 189$

2. $\frac{28}{35}$ ___ $\frac{4}{5}$

3. $\frac{8}{7}$ ___ $\frac{96}{49}$

4. 6 : 138 ___ 4 : 92

5. 12 : 60 ___ 4 : 24

6. $\frac{23}{29}$ ___ $\frac{46}{58}$

7. 10 : 90 ___ 45 : 5

8. 9 : 27 ___ 3 : 9

9. $\frac{4.2}{5.6}$ ___ $\frac{0.6}{0.8}$

10. $\frac{1.44}{1.32}$ ___ $\frac{1.2}{1.1}$

11. $\frac{8\frac{1}{2}}{5}$ ___ $\frac{25\frac{1}{2}}{7\frac{1}{2}}$

12. $\frac{2\frac{1}{3}}{1\frac{2}{5}}$ ___ $\frac{11\frac{2}{3}}{7}$

Solve each proportion. Check your work to justify your solutions.

13. $\frac{27}{63} = \frac{n}{7}$

$27 \cdot 7 = 63n$

$189 = 63n$

$\frac{189}{63} = \frac{63n}{63}$

$n = 3$

Check: $\frac{27}{63} \stackrel{?}{=} \frac{3}{7}$

$27 \cdot 7 \stackrel{?}{=} 63 \cdot 3$

$189 = 189$ True

14. $\frac{48}{x} = \frac{6}{12}$

15. $\frac{a}{15} = \frac{18}{45}$

16. $\frac{21}{b} = \frac{147}{105}$

17. $\frac{42}{24} = \frac{a}{4}$

18. $\frac{72}{64} = \frac{18}{r}$

19. $\frac{4.8}{1.32} = \frac{c}{1.1}$

20. $\frac{b}{\frac{1}{3}} = \frac{4}{2}$

2-6 Square Roots as Irrational Numbers

Name _____ Date _____

Product Property of Square Roots

For any positive real numbers a and b,
$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$

Simplify: $\sqrt{98}$

$\sqrt{98} = \sqrt{49 \cdot 2}$

$= \sqrt{49} \cdot \sqrt{2} = 7\sqrt{2}$

So $\sqrt{98}$ simplified is $7\sqrt{2}$.

Remember: A square root is in *simplest radical form* if the radicand has no factors that are perfect squares, other than 1.

Quotient Property of Square Roots

For any positive real numbers a and b,
$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$.

Simplify: $\sqrt{\frac{7}{144}}$

$\sqrt{\frac{7}{144}} = \frac{\sqrt{7}}{\sqrt{144}} = \frac{\sqrt{7}}{12}$

So $\sqrt{\frac{7}{144}}$ simplified is $\frac{\sqrt{7}}{12}$.

Simplify.

1. $\sqrt{12}$

$\sqrt{12} = \sqrt{4 \cdot 3}$
$= \sqrt{4} \cdot \sqrt{3}$
$= 2\sqrt{3}$

2. $\sqrt{252}$

3. $\sqrt{128}$

4. $\sqrt{216}$

5. $-\sqrt{500}$

6. $-\sqrt{243}$

7. $\sqrt{720}$

8. $\sqrt{99}$

9. $\sqrt{363}$

10. $-\sqrt{567}$

11. $\sqrt{92}$

12. $-\sqrt{75}$

13. $\sqrt{624}$

14. $\sqrt{160}$

15. $-\sqrt{456}$

16. $\sqrt{405}$

17. $\sqrt{464}$

18. $\sqrt{153}$

19. $-\sqrt{240}$

20. $\sqrt{450}$

21. $\sqrt{338}$

22. $\sqrt{1200}$

23. $\sqrt{1323}$

24. $\sqrt{1280}$

Write the equation of a line in slope-intercept form, given the coordinates of two points.

13. (1, 4), (6, 14)

$$m = \frac{14-4}{6-1} = \frac{10}{5} = 2$$
$$y - 4 = 2(x - 1)$$
$$y - 4 = 2x - 2$$
$$y = 2x + 2$$

14. (3, 0), (0, −12)

15. (4, −3), (2, 3)

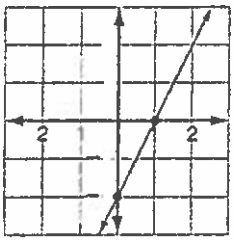
16. (3, −9), (5, −11)

17. (6, 4), (2, 6)

18. (4, −4), (8, −1)

Write the equation of a line in slope-intercept form. Then graph the line on a separate sheet of paper.

19. $y + 4 = 2(x + 1)$



$$y + 4 = 2x + 2$$
$$y = 2x - 2$$

20. $y - 1 = 4(x - 1)$

21. $y - 1 = -3(x + 2)$

22. Jamal has a membership to a popular sports club. The cost for membership is a fixed monthly fee plus a charge of $18 each time he uses a personal trainer. In June, he used a trainer's help 5 times and received a bill for $300. Using point-slope form, determine the fixed monthly fee Jamal has to pay to remain a member.

23. The cost to place an ad in a newspaper for 1 week depends on the number of lines in the ad. The costs for 2, 4, and 9 lines are $14.50, $18.50, and $28.50, respectively. Write the equation that represents the linear function. If you have $45, can you place an ad that is 17 lines long?

24. Without graphing, which equation has a graph that passes through the origin?

A. $y = 2x$ **B.** $y = 4$ **C.** $x = 6y$ **D.** both **A** and **C**