

Summer Prep for 8th Grade Algebra

Multiple Choice Questions:

___ 1. Simplify $(6a + 5b - 3) - (2a + 3b)$.

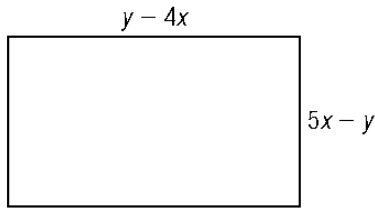
a. $4a + 2b - 3$

b. $4a + 8b - 3$

c. $8a + 2b - 3$

d. $8a + 8b - 3$

___ 2. Which expression represents the perimeter of the rectangle?



a. $2x$

b. $2x^2$

c. $6x + y$

d. $6x^2 + y$

___ 3. Which expression is equivalent to $8w(-2 + 3w)$?

a. $8w(-2) + 8w(3w)$

b. $8w - 2 + 3w$

c. $(8w - 2) + (8w + 3w)$

d. $8w(-2) + 3w$

___ 4. The lowest point in Michigan is on the shore of Lake Erie at ℓ ft above sea level. The elevation of the highest point in Michigan, the peak of Mt. Arvon, is at $3\ell + 263$ ft above sea level. The difference between the lowest and highest points is 1,407 ft. What is the elevation of the lowest point?

a. 286 ft above sea level

b. 381.3 ft above sea level

c. 572 ft above sea level

d. 1,144 ft above sea level

___ 5. Marti's age is 2 years greater than 4 times Doug's age. Lila's age is 1 year less than 6 times Doug's age. If Marti and Lila are twins, how old is Doug?

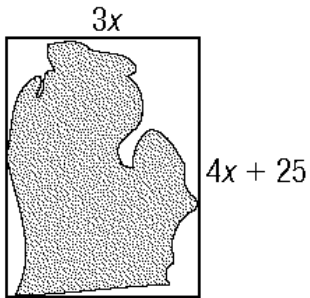
a. $\frac{1}{2}$ year

b. $1\frac{1}{2}$ years

c. 2 years

d. 8 years

___ 6. The lower peninsula of Michigan is $3x$ miles wide at its widest point and $4x + 25$ miles long at its longest point. The perimeter of the smallest rectangle that could contain the entire lower peninsula is 960 miles. What is the length of Michigan at its longest point?



- a. 134 miles
- b. 195 miles
- c. 240 miles
- d. 285 miles

7. Which table represents a linear relationship between x and y ?

a.

x	y
1	2
2	4
3	8

c.

x	y
1	4
2	5
3	6

b.

x	y
1	1
2	4
3	9

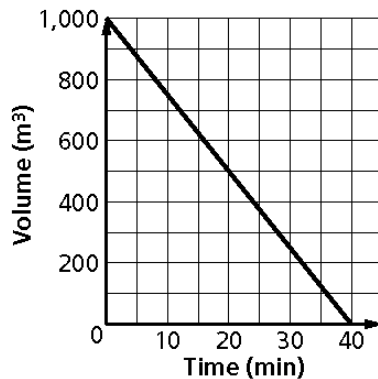
d.

x	y
1	2
2	$\frac{1}{2}$
3	$\frac{1}{3}$

8. Which list of (x, y) coordinates represents a linear relationship between x and y ?

- a. $(-1, -2), (-1, 2), (1, -2), (1, 2)$
- b. $(0, 1), (1, 0), (0, 2), (2, 0)$
- c. $(-2, 4), (-1, 1), (0, 0), (1, 1)$
- d. $(-2, -1), (-1, 0), (0, 1), (1, 2)$

The graph shows the volume of the oil in a storage tank. Oil is being pumped out of the tank at a constant rate.

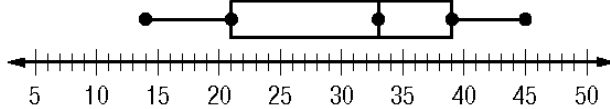


Stem	Leaf
0	2 4 5 6
1	3 3 5 8 8
2	1 4 5 7
3	4 6 6 7 8
4	0 0 3 8 9 9
	$1/2 = 12$

- a. 0
b. 4
- c. 9
d. 15

- ___ 21. A mother is told that her 1-year-old son Rick's weight is in the 2nd quartile of weights of 1-year-old boys. Which statement does this statistic support?
- a. Rick is probably heavier than the average 1-year-old boy.
b. 75% of 1-year-old boys are likely to weigh less than Rick.
c. At least 50% of 1-year-old boys are likely to weigh more than Rick.
d. Rick is probably the same weight as the majority of 1-year-old boys.
- ___ 22. The box-and-whisker plot represents a basketball team's points per game. What is the team's median points per game?

**Redtown Middle School Basketball Scores
2003-2004 Season**



- a. 21
b. 31
- c. 33
d. 39

- ___ 23. The median of a set of data is 40 and the interquartile range is 10. Which must be true of the data set?
- a. The lower quartile is 35.
b. The upper quartile is 50.
c. The upper quartile is at least 40.
d. The lower quartile is no greater than 30.
- ___ 24. Which lists the lower quartile (LQ), median (M), and upper quartile (UQ) for the data set: 4, 6, 2, 3, 3, 6, 8, 2, 9, 5, 9, 8, 2, 3, 4, 4, 4, 5, 3?
- a. LQ = 2, M = 4, UQ = 9
b. LQ = 3, M = 4, UQ = 6
- c. LQ = 3, M = 5, UQ = 8
d. LQ = 4, M = 5, UQ = 3
- ___ 25. Which representation most clearly shows the median of a data set?
- a. box-and-whisker plot
b. circle graph
- c. histogram
d. pictograph
- ___ 26. Kim creates a histogram to represent the number of U.S. states each of her classmates has visited. How many of Kim's classmates have visited 4 or more states?



- a. 6
- b. 9
- c. 22
- d. 28

___ 27. Ted's car gets 22 miles per gallon of gasoline. Which statement does this fact support?

- a. Ted can drive up to 22 miles each day.
- b. The tank of Ted's car holds 22 gallons of gasoline.
- c. Ted's car uses a gallon of gasoline for each 22 miles he drives.
- d. Ted can drive a mile each time he buys 22 gallons of gasoline.

___ 28. Which best describes the relationship between x and y in the table?

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

- a. direct variation
- b. inverse proportion
- c. linear
- d. quadratic

___ 29. The ages of the members of the Torres family are: 36, 11, 7, 34, and 7. What is the median age?

- a. 7
- b. 11
- c. 19
- d. 29

___ 30. Add $(2b - 6) + (5 + 8b)$.

- a. $10b - 1$
- b. $16b - 30$
- c. $10b^2 - 1$
- d. $16b^2 - 30$

___ 31. An elevator in an office tower starts a trip at 25 ft above the first floor. The elevator rises 120 ft/min. About how long will the elevator take to reach 200 ft above the first floor, if it makes no stops?

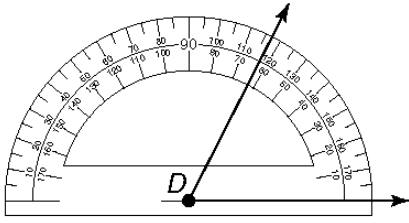
- a. 1.14 min
- b. 1.46 min
- c. 1.67 min
- d. 1.88 min

___ 32. What is the value of the expression $(-5) + 4 \cdot (-3) + 2 - 8$?

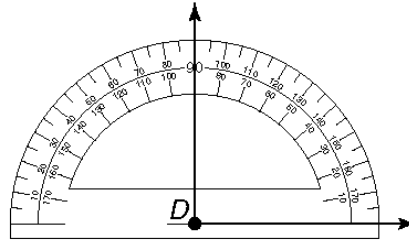
- a. -23
- b. -3
- c. 9
- d. 21

33. Phi is drawing parallelogram $ABCD$. He draws measure of $\angle A = 63$, measure of $\angle B = 117$, and measure of $\angle C = 63$. Which should Phi draw for $\angle D$?

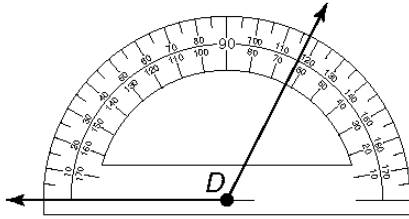
a.



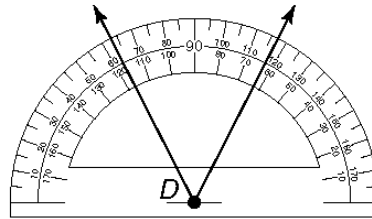
c.



b.



d.



34. Dee constructs equilateral triangle XYZ . Which statement should be true about her work?

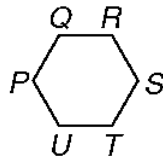
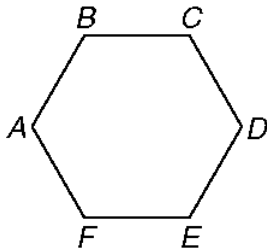
a. measure of angle X = measure of angle Y = measure of angle $Z = 60$

b. $XY^2 + YZ^2 = XZ^2$

c. $XY + YZ = XZ$

d. measure of angle X = measure of angle Y = measure of angle $Z = 180$

35. Each side of hexagon $ABCDEF$ measures 1 cm. Each side of hexagon $PQRSTU$ measures 0.5 cm. The hexagons are similar and the measure of angle $F = 120$. What is the measure of angle U ?



a. 40

c. 160

b. 120

d. 360

36. If triangle JKL is similar to triangle MNO , what is the length of \overline{MN} ?

- a. 24 oz
- b. 44 oz
- c. 80 oz
- d. 88 oz

___ 41. Diana has a picture that is 5 in. long and 7 in. wide. She uses a copy machine to enlarge it to 12.5 in. long. How wide is the enlarged copy?

- a. 12.5 in.
- b. 14.5 in.
- c. 17.5 in.
- d. 19.5 in.

___ 42. The low temperature one day in Copper Harbor is -5°F . The high temperature that day is 15°F . By how many degrees did the temperature rise?

- a. 5°F
- b. 10°F
- c. 15°F
- d. 20°F

___ 43. Dr. Wills pours 3 mL of liquid into an empty beaker. He adds 3 mL more to the beaker. Then he adds 3 mL 14 more times. He then pours all the liquid evenly among 4 test tubes. Finally he takes 3 mL of liquid out of one of the tubes. How many milliliters of liquid are left in this tube?

- a. 0 mL
- b. 9 mL
- c. 21 mL
- d. 45 mL

___ 44. What is the value of x if $0.5(-3 + 1.75) = x$?

- a. -2.375
- b. -0.625
- c. 0.25
- d. 0.625

___ 45. The table shows Rita's sales at a farmers' market. What is the weighted average dollars per pound of vegetables Rita sold?

	Price per Pound	Pounds Sold
Carrots	\$1.25	45
Potatoes	\$0.75	55
Celery	\$1.10	20
Lettuce	\$1.50	30

- a. \$1.10/lb
- b. \$1.15/lb
- c. \$4.60/lb
- d. \$9.38/lb

___ 46. Which is the best estimate of $\sqrt{23}$?

- a. 4.8
- b. 11.5
- c. 46
- d. 529

___ 47. Which best describes the x -intercept of the graph of a linear equation?

- a. the value of y when $x = 0$
- b. the value of $\frac{x}{y}$ for $y \neq 0$
- c. the value of xy for $x \neq 0$
- d. the value of x when $y = 0$

___ 48. Simplify $-3r + 4s - 6s + 8r$.

- a. $3rs$
- b. $-13rs$
- c. $5r - 2s$
- d. $-11r - 2s$

___ 49. Simplify $-\frac{6}{7} \div \frac{3}{4}$.

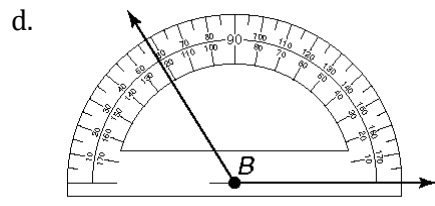
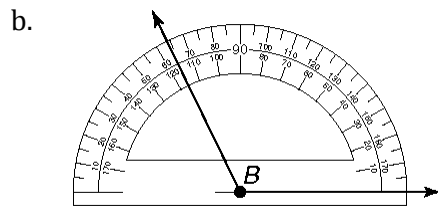
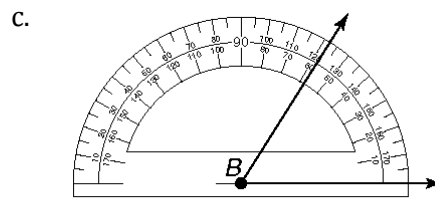
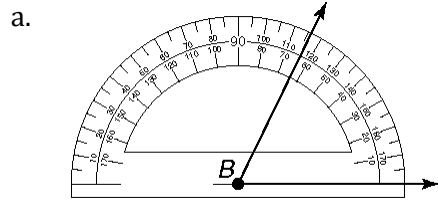
a. $-\frac{8}{7}$

b. $-\frac{9}{11}$

c. $-\frac{9}{14}$

d. $-\frac{3}{28}$

___ 50. Latoya is drawing isosceles triangle ABC . She draws measure of angle $A = 58$ and measure of angle $C = 58$. Which should Layla draw for angle B ?



Short Answer Questions:

51. Use the equation $2y + 3x = 4$ for Parts A, B, and C below.

Part A Write the equation in $y = mx + b$ form.

Part B Identify the slope and the coordinates of the y -intercept.

Part C Graph the equation.

52. $\triangle ABC$ and $\triangle DEF$ are isosceles triangles. $AwBw$ is NOT congruent to $DwEw$.

Part A Without using any tools, complete the following:

measure of angle $B = \underline{\hspace{2cm}}$, because $\underline{\hspace{2cm}}$

measure of angle $C = \underline{\hspace{2cm}}$, because $\underline{\hspace{2cm}}$

measure of angle $E = \underline{\hspace{2cm}}$, because $\underline{\hspace{2cm}}$

measure of angle $F = \underline{\hspace{2cm}}$, because $\underline{\hspace{2cm}}$

Part B Is triangle ABC similar to triangle DEF ? Explain why or why not.

53. Ms. LaSalle's students' grades on an exam are 83, 55, 79, 90, 85, 64, 94, 78, 89, 92, 60, 75, 91, 80, 67, 73, 87, and 84.

Part A Find the median, lower quartile, upper quartile, and interquartile range of the grades. Show your work.

Part B Create a box-and-whisker plot to represent the grades.

Part C About what percent of students scored between the lower quartile and upper quartile grades?

54. Use the equation $0 = -24x - 8y - 8$ for Parts A and B below.

Part A Write the equation in $y = mx + b$ form.

Part B Graph the equation. Label the slope and y -intercept.

55. Use the equation $x + \frac{1}{2}y = 0$ for Parts A, B, and C below.

Part A Write the equation in $y = mx$ form.

Part B Identify the slope and the coordinates of the y -intercept.

Part C Graph the equation.

56. The stem-and-leaf plot shows the number of hits a small web site receives each hour for one day.

Stem	Leaf
0	6 8 9
1	9
2	
3	5 8 8
4	0 2 7 7 9
5	0 4 7 8 8 8
6	6 9 9
7	2 4 5
	$1/2 = 12$

Part A Find the median, quartiles, and interquartile range of the data.

Part B The site's owner may buy some software that is useful for sites receiving at least 70 hits per hour. Based on the statistics in Part A, would this be a wise purchase? Explain.

Summer Prep for 8th Grade Algebra Answer Section

MULTIPLE CHOICE

1. A
2. A
3. A
4. C
5. B
6. D
7. C
8. D
9. A
10. B
11. D
12. B
13. A
14. A
15. B
16. D
17. C
18. C
19. B
20. D
21. C
22. C
23. C
24. B
25. A
26. B
27. C
28. C
29. B
30. A
31. B
32. A
33. B
34. A
35. B
36. C
37. D
38. A
39. C
40. C

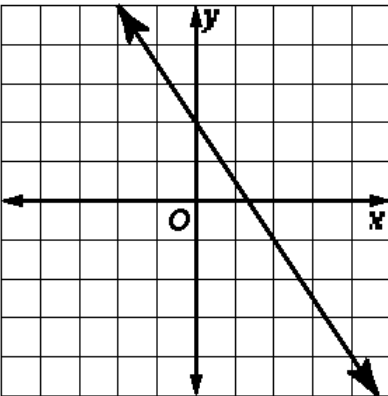
- 41. C
- 42. D
- 43. B
- 44. B
- 45. A
- 46. A
- 47. D
- 48. C
- 49. A
- 50. A

SHORT ANSWER

51. **Part A** $2y + 3x = 4$
 $2y = -3x + 4$
 $y = -\frac{3}{2}x + 2$

Part B slope is $-\frac{3}{2}$; coordinates of y-intercept are (0, 2)

Part C



52. **Part A:**
 66
 angles opposite congruent sides of a triangle are congruent.
 48
 $180 - 66 - 66 = 48$.
 66
 angles opposite congruent sides of a triangle are congruent.
 48
 $180 - 66 - 66 = 48$.

Part B: Yes.

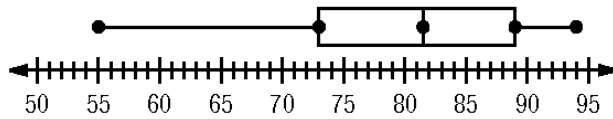
$\angle A \cong \angle D$, $\angle B \cong \angle E$, and $\angle C \cong \angle F$.

If all corresponding angles of two triangles are congruent, the triangles are similar. Therefore, $\triangle ABC \cong \triangle DEF$.

53. **Part A:** 55, 60, 64, 67, 73, 75, 78, 79, 80, 83, 84, 85, 87, 89, 90, 91, 92, 94

median = $\frac{80 + 83}{2} = 81.5$; lower quartile = 73; upper quartile = 89; interquartile range = $89 - 73 = 16$

Part B:



Part C: 50%

54. **Part A:**

$$0 = -24x - 8y - 8$$

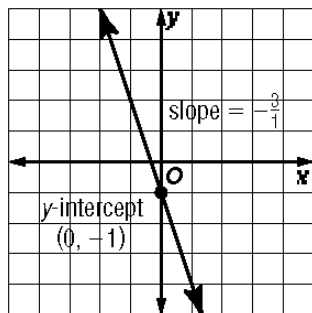
$$0 + 8y = -24x - 8y - 8 + 8y$$

$$8y = -24x - 8$$

$$\frac{8y}{8} = \frac{-24x}{8} - \frac{8}{8}$$

$$y = -3x - 1$$

Part B:



55. **Part A**

$$x + \frac{1}{2}y = 0$$

$$x - x + \frac{1}{2}y = 0 - x$$

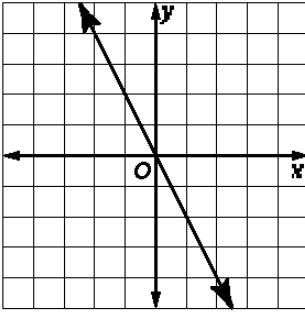
$$\frac{1}{2}y = -x$$

$$2 \cdot \frac{1}{2}y = 2 \cdot -x$$

$$y = -2x$$

Part B slope is -2; coordinates of y-intercept are (0, 0)

Part C



56. **Part A** median = $\frac{49 + 50}{2} = 49.5$;
lower quartile = 38;
upper quartile = $\frac{58 + 66}{2} = 62$;
interquartile range = $62 - 38 = 24$

Part B No. For most of the day, the site received fewer than 70 hits per hour.