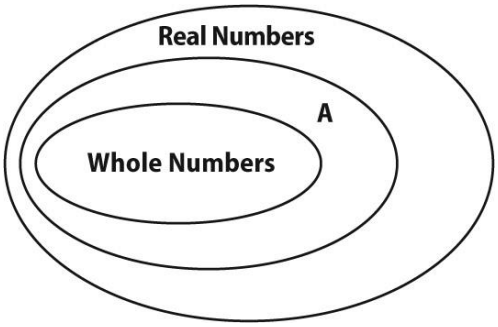
Name _____ Date _____ Class_____

Summer Homework Packet (Algebra)

1. Which label or labels could replace “A” in the diagram below?



   A Rational Numbers only
   B Rational Numbers or Integers
   C Integers only
   D Irrational Numbers

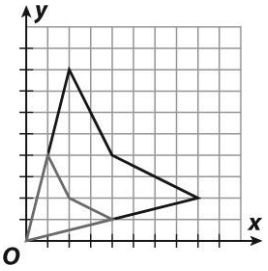
2. Between which two integers does the value of $\sqrt{88}$ lie?

   _____

3. What is 8,980,000 in scientific notation?

   _____

4. The gray figure is the image of the black figure after a dilation.



   Which represents the dilation?

   A $(x,y) \rightarrow \left(\frac{1}{4}x, \frac{1}{4}y\right)$

   B $(x,y) \rightarrow \left(\frac{1}{2}x, \frac{1}{2}y\right)$

   C $(x, y) \rightarrow (2x, 2y)$

   D $(x, y) \rightarrow (4x, 4y)$

5. The lengths in centimeters of four line segments are shown below.

$$3.12,\ 3.24,\ 3\frac{1}{4},\ \sqrt{10}$$

   Write the lengths in order from **least** to **greatest**.

   _____

6. A figure is dilated by a factor of 2. Which statement about the dimensions of the image is true?

   A The perimeter of the original figure is multiplied by 4. The area is doubled.
   B The perimeter and area of the original figure are doubled.
   C The perimeter of the original figure is multiplied by 4. The area is multiplied by 8.
   D The perimeter of the original figure is doubled. The area is multiplied by 4.

7. The points $A(0, 0)$, $B(2, 2)$, $C(3, 3)$ and $D(5, 5)$ all lie on the line $y = x$. Ana calculated the slopes of $\overline{AB}$ and $\overline{CD}$. What can she conclude?

   A The slopes are the same.
   B The slope of $\overline{AB}$ is greater than the slope of $\overline{CD}$.
   C The slope of $\overline{CD}$ is greater than the slope of $\overline{AB}$.
   D The slopes of $\overline{AB}$ and $\overline{CD}$ are negative.

Summer Homework Packet

8. What is the slope of the line described by the data in the table below?

x	−1	1	3	5
y	3	8	13	18

_____

9. A photo of a painting measures 13 inches by 17 inches. The scale of the photo to the original painting is 1 inch to 3 inches. What size is the painting?

   A 4.3 in. × 5.7 in.

   B 26 in. × 34 in.

   C 39 in. × 51 in.

   D 65 in. × 85 in.

10. Which fraction is equivalent to −0.06?

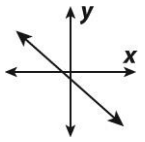
    A $-\frac{1}{6}$ C $-\frac{7}{10}$

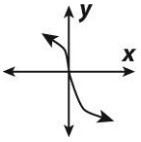
    B $-\frac{3}{5}$ D $-\frac{3}{50}$

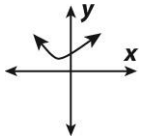
11. Marcus sells homemade pies for $10.50 a pie. It costs $1.25 for the ingredients to bake each pie. Marcus bought a new oven for $800. How many pies must Marcus sell in order to begin making a profit?

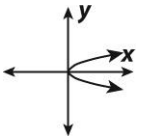
_____

12. Which of the following graphs shows a linear relationship?

    A 

    B 

    C 

    D 

13. What is the value of n in the equation: $8n + 9 = -n + 5$?

_____

14. Which of the following equations represents a proportional relationship?

    A $y = 3x$ C $y = \frac{3}{x}$

    B $y = \frac{1}{2}x + 1$ D $y = x + \frac{1}{2}$

15. Terry skated 2 miles in $\frac{1}{2}$ hour. Which of the following represents the unit rate that Terry skated?

    A $\frac{1}{2}$ mi/h C $\left(\frac{1}{2} \div 2\right)$ mi/h

    B $\left(2 \div \frac{1}{2}\right)$ mi/h D 2 mi/h

Summer Homework Packet

16. Kenneth graphed the triangle *A'B'C'* by dilating triangle *ABC*. Which of the following **must** be true?

    A The ratios of corresponding sides of *ABC* and *A'B'C'* are equal.

    B The area of *A'B'C'* is greater than the area of *ABC.*

    C Triangle *ABC* is congruent to triangle *A'B'C'*.

    D Triangle *ABC* is a isosceles triangle.

17. A cell phone company charges $40 for the phone plus a monthly service charge of $25. The equation below describes the cost *y* after *x* months.

    $$y = 25x + 40$$

    Which is true of the relationship between *x* and *y*?

    A It is linear and proportional.

    B It is linear and non-proportional.

    C It is not linear and proportional.

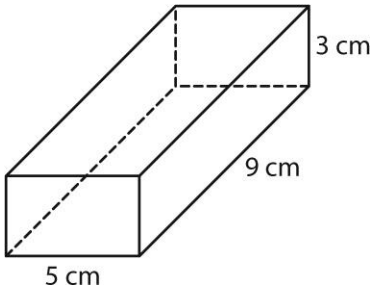
    D It is not linear and non-proportional.

18. A cheetah's speed was timed over a 50-yard distance. The cheetah was clocked running 60 miles per hour. Which equation shows the relationship between the distance, *y*, and time, *x*, the cheetah runs?

    A $y = 50x$ B $y = 60x + 50$

    C $y = 50x + 60$ D $y = 60x$

19. What is the volume of the rectangular prism?



_____

20. Dallas got a raise. His hourly wage was increased from $9 to $10.25. What was the percent increase in Dallas's wage to the nearest whole percent?

    A 10% C 14%

    B 12% D 125%

21. Ryan drew a cylinder and a cone with identical bases and heights. Which of the following is true?

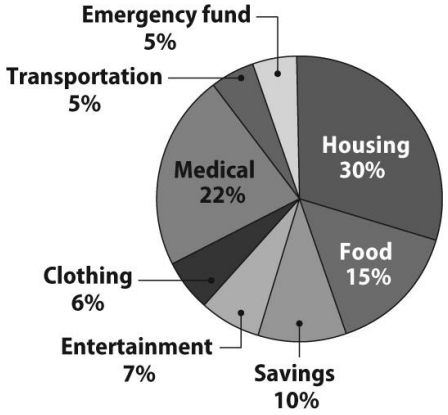
    A The volumes are the same.

    B The volume of the cylinder is three times the volume of the cone.

    C The volume of the cone is three times the volume of the cylinder.

    D The volume of the cylinder is four-thirds the volume of the cone.

22. The Grabo family's monthly budget is shown in the circle graph. The family has a monthly income of $5,000. How much money do they spend on housing each month?



    A $250 C $1,100

    B $500 D $1,500

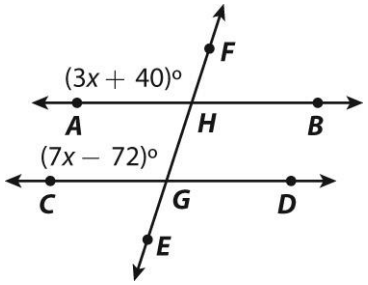
Summer Homework Packet

23. A sphere has a radius of 6 centimeters. What is the volume of the sphere?

A 72π cm^3 C 200π cm^3

B 144π cm^3 D 288π cm^3

24. The figure shows two parallel lines intersected by a transversal. What is the measure of $\angle CGH$?



_____

25. Which of the following is the solution for the inequality below?

$$-3x + 2 < 8$$

A $x > -3$ C $x < -2$

B $x > -2$ D $x < -3$

26. A bicycle rental company charges a $12 fee plus $3 per hour. Which equation can be solved to find the number of hours, x, a bicycle was rented if the total charge was $25.50?

A $25.5 = 12x - 3$

B $25.5 = 12x + 3$

C $25.5 = 3x - 12$

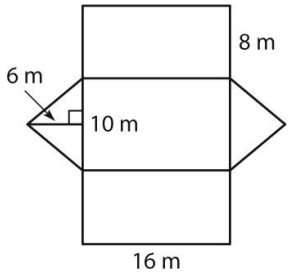
D $25.5 = 3x + 12$

27. A tank holds 50 cubic feet of gas to heat a home. The table shows the amount of gas left in the tank after each of five consecutive weeks. What is the rate of change?

Week	1	2	3	4	5
Gas (ft^3)	44	38	32	26	20

_____

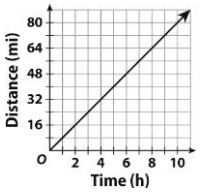
28. The net below is of a triangular prism. What is the surface area of the prism?



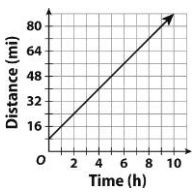
_____

29. Alexander rides his bicycle at a speed of 8 miles per hour. Which graph represents this relationship?

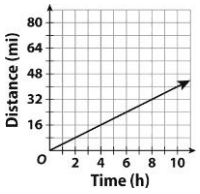
A



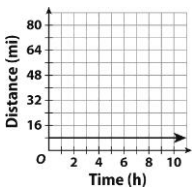
C



B



D



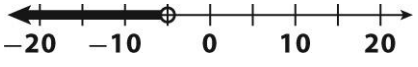
Summer Homework Packet

30. The measures of three angles of a triangle are $(2x)°$, $(3x)°$ and $(x + 60)°$. What is the value of x?

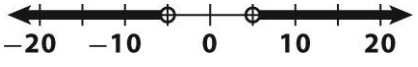
_____

31. Which number line represents the solution to the inequality $4x + 20 < 40$?

A 

B 

C 

D 

32. Under which transformation is orientation **not** preserved?

A translation C reflection

B dilation D rotation

33. Daria applied a transformation to triangle *ABC* to obtain triangle *A'B'C'.* The two triangles are **not** congruent. Which of the following could be the transformation Daria applied?

A translation C reflection

B dilation D rotation

34. The Gleason family has a monthly budget of $4,500. Mr. Gleason has a full-time job and takes home $900 each week. Mrs. Gleason works part time and brings home $9 for every hour she works. How many hours per month must Mrs. Gleason work to make sure that she and Mr. Gleason have met their monthly budget?

_____

35. Which expression represents 81?

A 3^3 C 3^5

B 3^4 D 3^6

36. The vertices of a triangle are located at the points $A(1, 1)$, $B(2, -3)$ and $C(5, 0)$. The triangle is translated 4 units down, then reflected across the x-axis to obtain triangle *A'B'C'*. What are the coordinates of the vertices of triangle *A'B'C'*?

_____

37. Isabel obtained an image of triangle *WXY* under a dilation with a scale factor of 3. Which of the following describes the area and perimeter of the new figure?

A The original area is multiplied by 9, and the perimeter is multiplied by 3.

B The original area is multiplied by 3, and the perimeter is multiplied by 3.

C The original area is divided by 9, and the perimeter is divided by 3.

D The original area is divided by 3, and the perimeter is divided by 3.

38. Jana has a bag of marbles. Without looking, she removes one marble from the bag, records the color, and replaces it. She repeats this process 50 times and records the results in the table.

Color	Frequency
Red	11
Blue	14
Green	9
Yellow	16

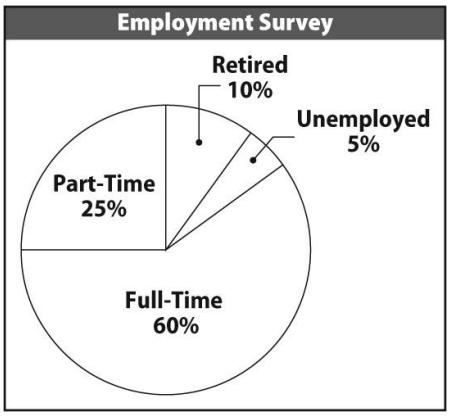
What is the probability that Jana will pick a red marble on her fifty-first time?

A $\frac{9}{50}$ C $\frac{7}{25}$

B $\frac{11}{50}$ D $\frac{8}{25}$

Summer Homework Packet

39. The circle graph shows the results of an employment survey of 800 people. How many of the people surveyed were employed full time?



_____

40. Which of the following is a random sample?

A Members of a polling organization survey city voters about who they expect to be elected mayor.

B A survey company asks 100 members at a concert who their favorite singer is.

C Customers at a pizza shop are surveyed about their favorite food.

D Carlos uses an e-mail survey to find out how many students have computers at home.

41. A 10-inch piece of ribbon is 25.4 centimeters long. How long will a 36-inch piece of ribbon be to the nearest hundredth of a centimeter?

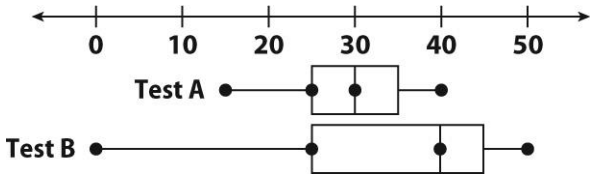
A 14.17 cm C 141.73 cm

B 91.44 cm D 914.40 cm

42. One circle has a diameter of 10 inches. A second circle has a diameter that is twice the diameter of the first circle. What is the ratio of the area of the smaller circle to the larger circle?

A 1:2 B 1:3.14 C 1:4 D 1:8

Use the box plot for 43–44.



43. What is the difference between the medians for Test A and Test B?

_____

44. Which statement is true based on the box plots?

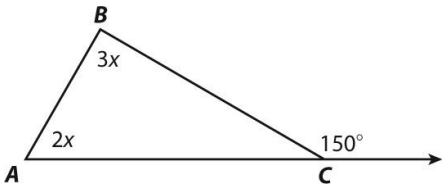
A Test A had the greater range of scores.

B More students did better on Test A than on Test B.

C The interquartile range for Test B is greater than for Test A.

D One half of the students on each test got 25 or fewer questions correct.

Use the figure for 45–46.



45. What is the measure of $\angle BAC$?

_____

46. Which of the following is **not** true?

A $2x + 3x = 150$ C $3x - 2x = 30$

B $2x + 3x + 30 = 180$ D $2x + 3x \geq 180$

47. Which equation represents the data shown in the table below?

Cost (y)	5	10	15	20
Gallon (x)	2	4	6	8

A $y = 2x + 1$ C $y = 2.5x$

B $y = 3x - 1$ D $y = 2.5x + 1$

Summer Homework Packet

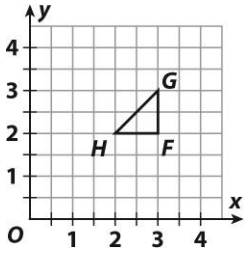
48. A sphere has a radius of 2 inches. What is the volume of the sphere to the nearest tenth?

_____

49. The mass of Earth in kilograms is 5.97×10^{24}, and the mass of the Moon is 7.35×10^{22}. What is the sum of the masses of Earth and its moon?

_____

50. If the triangle shown is rotated 180° about the origin, what are the coordinates of Point *F*?



_____

51. What value of *x* is the solution to the equation?

$-5(x - 5) = 2(-4x + 5)$

_____

52. In a circle of any size, what ratio does pi (π) represent?

A the ratio of the radius to the diameter

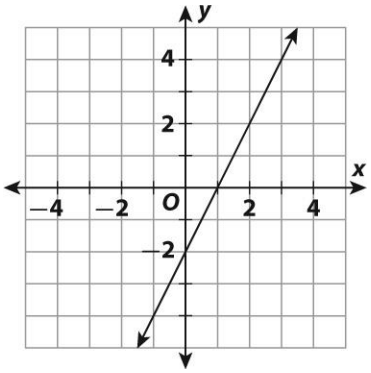
B the ratio of the circumference to the diameter

C the ratio of the circumference to the radius

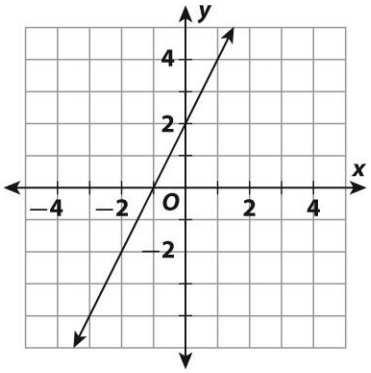
D the ratio of the circumference to the area

53. Which graph below shows a linear equation with a slope of 2 and a *y*-intercept of −2?

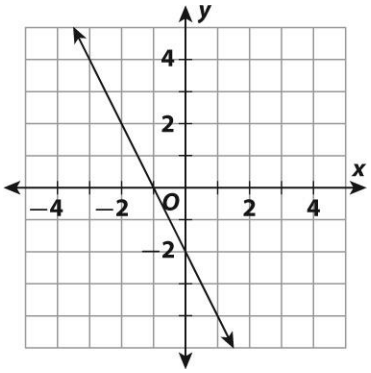
A



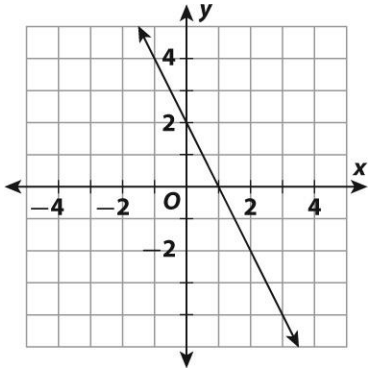
B



C



D



Summer Homework Packet

54. Lourenço analyzed prices of laptop computers based on the speed of the processor. He calculated the trend line to be $y = 101x + 207.85$, where x is the speed of the processor in gigahertz and y is the price. Which amount below is closest to the price of a laptop with a processor speed of 2.5 gigahertz?

    A $309 C $460

    B $455 D $620

55. At 6 A.M. the temperature was −8°C. At noon the temperature was 3°C. What was the change of temperature between 6 A.M. and noon?

    _____

56. What is the quotient of $-18 \div \left(-\frac{1}{6}\right)$?

    _____

57. Erica wrote the number 3.24×10^{-3} in standard form. What number did she write?

    _____

58. The vertices of a triangle are located at the points $A(-1, 0)$, $B(-2, 2)$ and $C(3, 3)$. $A'B'C'$ is the result of rotating ABC counterclockwise 90° about the origin. Which formula can be used to find the coordinates of the vertices of $A'B'C'$?

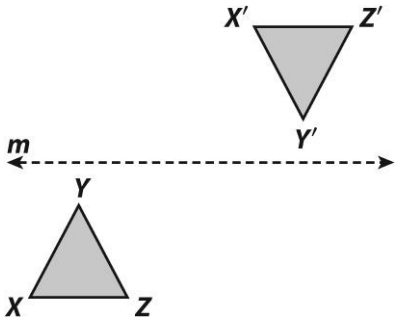
    A $(x, y) \rightarrow (-x, y)$

    B $(x, y) \rightarrow (-x, -y)$

    C $(x, y) \rightarrow (y, -x)$

    D $(x, y) \rightarrow (-y, x)$

59. Jerlyn applied a sequence of transformations to obtain triangle $X'Y'Z'$ from triangle XYZ as shown below.



    Which of the following describes the sequence of transformations?

    A a translation followed by a reflection across line m

    B a translation followed by a 180° counterclockwise rotation

    C a dilation with scale factor 2

    D a reflection across line m followed by a 180° counterclockwise rotation

60. What is true about the relationship between miles and gallons?

Gallons	2	5	6	9
Miles	46	115	138	207

    A There is no relationship between miles and gallons.

    B There is a proportional relationship between miles and gallons.

    C There is a 1 to 23 relationship between miles and gallons.

    D There is a 20 to 1 relationship between miles and gallons.

Name _____ Date _____ Class _____

Summer Homework Packet

Solve.

61. Amman drew a rectangle with a perimeter of 36 units. He then performed a dilation with a scale factor of 3. What is the perimeter in units of the resulting image? Show your work.

_____

62. Each hour, the temperature dropped by $3\frac{1}{2}$ degrees. What was the change in temperature in $2\frac{1}{2}$ hours?

_____

63. Elizabeth wrote the number 8.45×10^{-2} in standard form. Which number did she write?

_____

64. One triangle has side lengths of 5 inches, 12 inches, and 13 inches. The side lengths of a second triangle are 15 inches, 36 inches, and 39 inches. What is the constant of proportionality between the two triangles?

_____

65. The point (–2, –3) is rotated 180° counterclockwise about the origin. What is the *y*-coordinate of the resulting image?

_____

66. What is the slope of the line described by the data in the table below? Show how you find the slope.

x	–2	0	4	12	16
y	5	6	8	12	14

_____

67. The volume of a cone is 242.1 cubic centimeters. A cylinder has the same base and height as the cone. What is the volume in cubic centimeters of the cylinder? Explain how you found the volume.

_____

68. At a fruit stand, Rajendra can purchase three apples and one orange for the same price as five apples. The price of the orange is $0.84. What is the price in dollars of each apple? Write and solve the equation.

_____

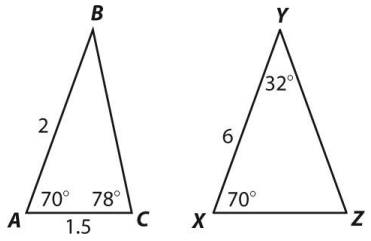
69. A rectangular prism is 10 inches long, 6 inches wide, and 4 inches high. What is the surface area of this prism in square inches?

_____

70. Samantha deposited $650 into a savings account that pays 3.5% interest compounded annually. After 6 years what will be the value of her investment in dollars?

_____

71. How many units long is $\overline{XZ}$?



_____

72. What is the value of the expression below?

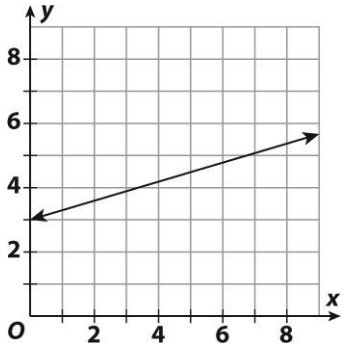
$$-3\left(-\frac{1}{6}\right)(-2)(2) \div \left(-\frac{1}{4}\right)$$

Name _____ Date _____ Class _____

Summer Homework Packet

Solve.

73. What is a *y*-intercept? What is the *y*-intercept of the line graphed below?



_____

74. What is the probability of flipping two coins and both landing heads? Give your answer as a decimal.

_____

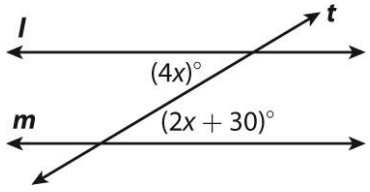
75. At a supermarket, the price of a carton of blueberries varies directly with its weight. A carton that weights 0.5 pound costs $4.25. What is the price in dollars of a carton of blueberries that weighs 0.75 pound? Show your work.

_____

_____

76. In the diagram below, lines *l* and *m* are parallel. Both are intersected by transversal *t*.

What is the value of *x*? Explain your reasoning.



_____

77. What is the value of *x* in the equation below?

$$\frac{1}{2}x + 5 = \frac{1}{4}x + 8$$

_____

78. A company knows that 30% of their customers who come to the store will examine the merchandise and then order it online. The company wants to know the probability that out of the next 4 customers, exactly one will buy online. How could the company find this probability?

_____

_____

79. Three students simplified the expression:

$2x - 3(y - 2x) + (-5)(-2y)$.

Their answers are below.

Amber: $-4x + 7y$

Butch: $4x + 7y$

Carl: $8x + 7y$

Tell who is correct. Explain the error the other students made.

_____

_____

_____

80. Grant filled a cylindrical tank with water. The tank has a base radius of 1.2 meters and a height of 3 meters. To the nearest tenth, how many cubic meters of water are in the tank?

_____