Name: _____ Class: _____ Date: _____ ID: A

MME Review - Mathematics

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Evaluate the expression $t + y$ for $t = 4$ and $y = 3$.
   A. 1
   B. 7
   C. 12
   D. 8

2. Evaluate the expression xy for $x = 6$ and $y = 3$.
   F. 21
   G. 24
   H. 9
   J. 18

3. Add.
   $34 + (-21)$
   A. 55
   B. 13
   C. –55
   D. –13

4. Write 9 as a power of the base 3.
   F. $\frac{9}{3}$
   G. 3^2
   H. 3^9
   J. 2^3

5. Simplify by combining like terms.
   $3x^3 + 9z + 2x^3 + 5z + 6x^2$
   A. $x^3 + 4z + 6x^2$
   B. $5x^3 + 14z + 6x^2$
   C. $6x^3 + 45z + 6x^2$
   D. $11x^3 + 14z$

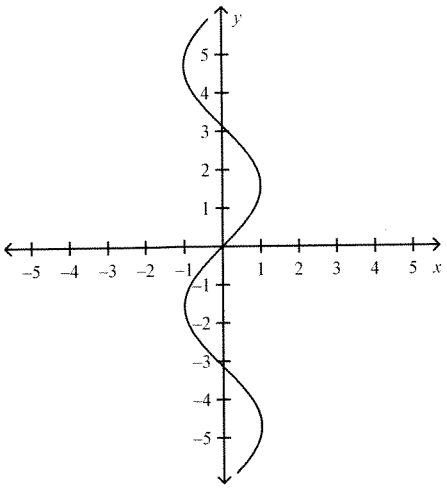
6. A phone company advertises a new plan in which the customer pays a fixed amount of $25 per month for unlimited calls in the country, and $0.10 per minute for international calls. Find a rule for the monthly payment a customer pays according to the new plan. Write ordered pairs for the monthly payment when the customer uses 90, 120, 145, and 150 international minutes in a month.
   F. $y = 0.10 + 25x$; (34, 90), (37, 120), (39.5, 145), (40, 150)
   G. $y = 25 + 0.10x$; (90, 34), (120, 37), (145, 39.5), (150, 40)
   H. $y = 25 + 0.10x$; (34, 90), (37, 120), (145, 39.5), (150, 40)
   J. $y = 0.10 + 25x$; (34, 90), (37, 120), (145, 39.5), (150, 40)

7. Solve $|6x - 9| + 5 = 2$.
   A. $x = 1$
   B. $x = \frac{11}{6}$
   C. No solution
   D. $x = \frac{8}{3}$

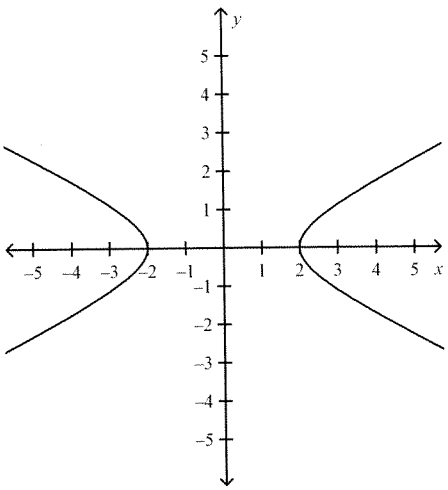
8. What is the greatest possible integer solution of the inequality $2.847x < 15.168$?
   F. 5.33
   G. 4
   H. 6
   J. 5

9. Which graph represents a function?

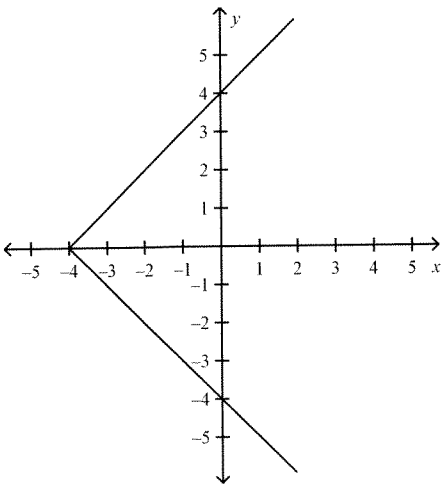
A.



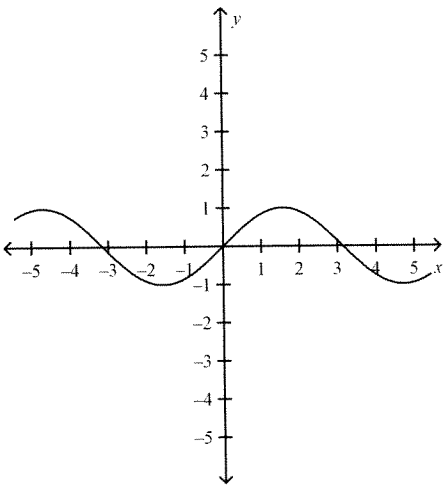
C.



B.



D.



10. Identify the independent and dependent variables in the situation.

The amount of electricity used for air conditioning in homes increases as the temperature increases.

F. Independent: amount of electricity used; Dependent: temperature

G. Independent: temperature; Dependent: amount of electricity used

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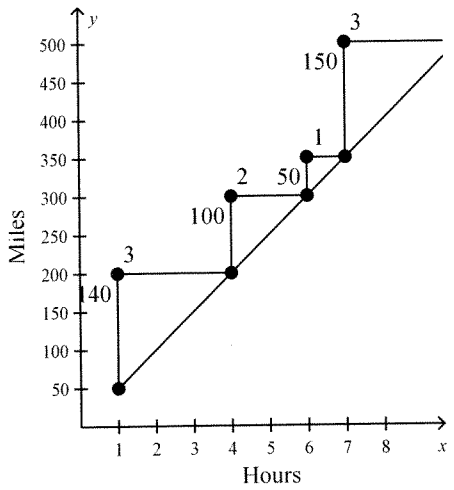
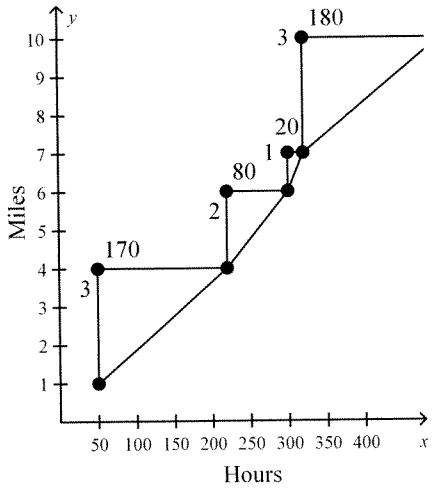
11. Jim drove for several hours, recording the distance he had traveled in miles. Graph the data and show the rates of change.

Hours	1	4	6	7	10
Miles	50	220	300	320	500

A.



C.



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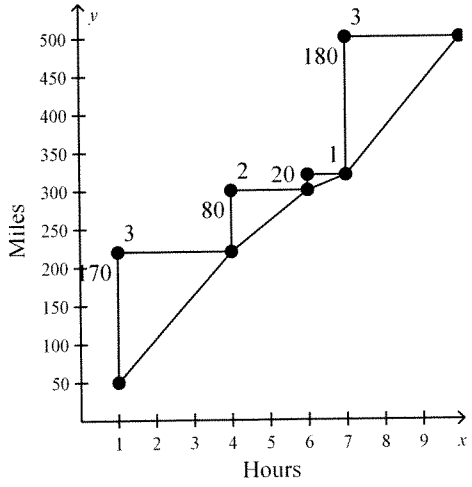
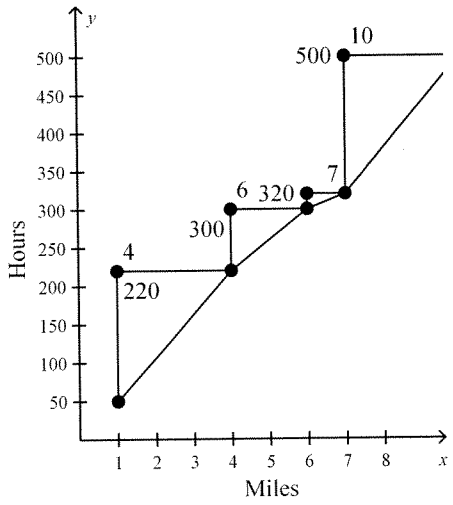


D.



12. Write an equation in slope-intercept form for the line parallel to $y = 5x - 2$ that passes through the point $(8, -2)$.

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

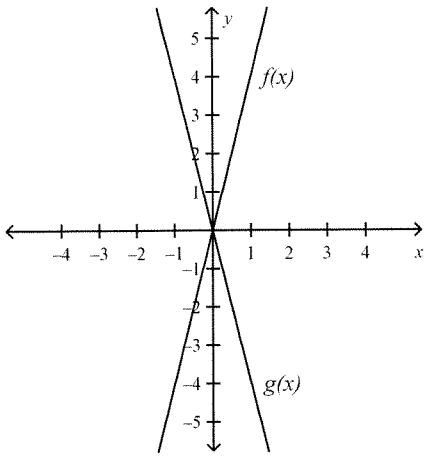
G. $y = -\frac{1}{5}x - \frac{2}{5}$

H. $y = 5x + 32$

J. $y = 5x - 42$

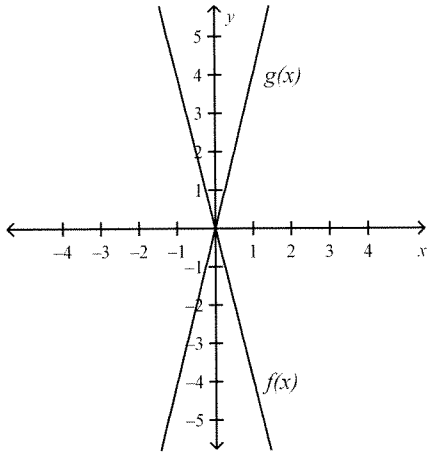
13. Graph $f(x) = -4x$. Then reflect the graph of $f(x)$ across the x-axis. Write a function $g(x)$ to describe the new graph.

A.



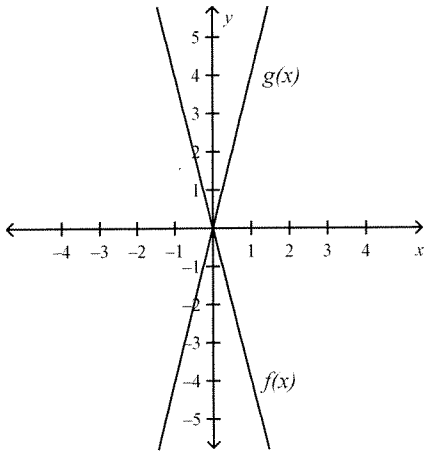
$g(x) = 4x$

C.



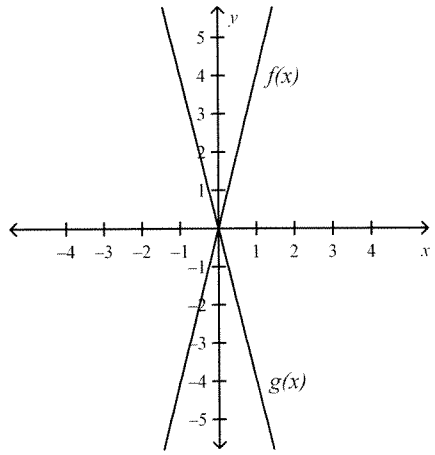
$g(x) = 4x$

B.



$g(x) = -4x$

D.



$g(x) = -4x$

14. Solve $\begin{cases} 3x + y = -3 \\ y = x + 5 \end{cases}$ by using substitution. Express your answer as an ordered pair.

F. (3, –2)

G. $(-\frac{8}{3}, -3)$

H. $(-\frac{4}{3}, 1)$

J. (–2, 3)

15. Factor $4x^3 - 16x^2 + 12 - 3x$.

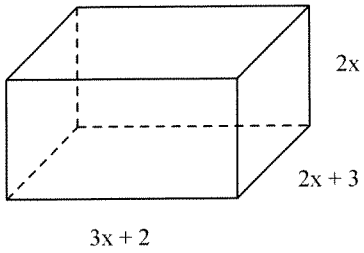
A. $(x-4)(4x^2-3)$

B. $(x-4)(4x^2-1)$

C. $4x^2(x-4) + 3(4-x)$

D. $(x-4)(4x^2+3)$

16. Write a polynomial that represents the volume of the prism using x.



F. $7x+5$
G. $12x^3+26x^2+12x$
H. $12x^2+26x+12$
J. $12x^3+10x$

17. Find the axis of symmetry of the graph of $y=3x^2+6x+4$.
A. $y=-1$
B. $x=-1$
C. $x=1$
D. $y=1$

18. Solve $8x=x^2-9$ by using the Quadratic Formula.
F. $x=9$ or $x=-1$
G. $x=1$ or $x=-9$
H. $x=54$ or $x=-46$
J. $x=18$ or $x=-2$

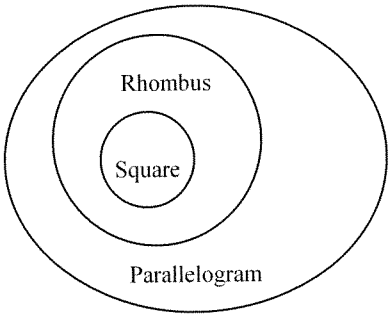
19. A bag contains hair ribbons for a spirit rally. The bag contains 3 black ribbons and 12 green ribbons. Lila selects a ribbon at random, then Jessica selects a ribbon at random from the remaining ribbons. What is the probability that Lila selects a black ribbon and Jessica selects a green ribbon? Express your answer as a fraction in simplest form.
A. $\frac{4}{25}$
B. $\frac{6}{35}$
C. $\frac{11}{70}$
D. $\frac{4}{35}$

20. Subtract.
$3\sqrt{3}-15\sqrt{3}$
F. $-12\sqrt{3}$
G. $18\sqrt{6}$
H. $18\sqrt{3}$
J. -12

21. The frequency of a radio wave varies inversely as its wavelength. If a 300-meter wave has a frequency of 1,000 kilohertz, what is the wavelength of a wave that has a frequency of 150 kilohertz? Round your answer to the nearest meter.
A. 500 m
B. 2,000 m
C. 6,000 m
D. 45 m

22. Which rational function has a graph with the horizontal asymptote $y=-3$?
F. $y=\frac{1}{x}-3$
G. $y=\frac{1}{x+3}$
H. $y=\frac{1}{x-3}$
J. $y=-\frac{3}{x}$

23. What statement can be determined from the diagram?



A. Every square is a rhombus.
B. Every rhombus is a square.
C. No parallelogram is a rhombus.
D. No parallelogram is a square.

24. Evaluate the expression $g + s$ for $g = 9$ and $s = 3$.
F. 12
G. 6
H. 27
J. 13

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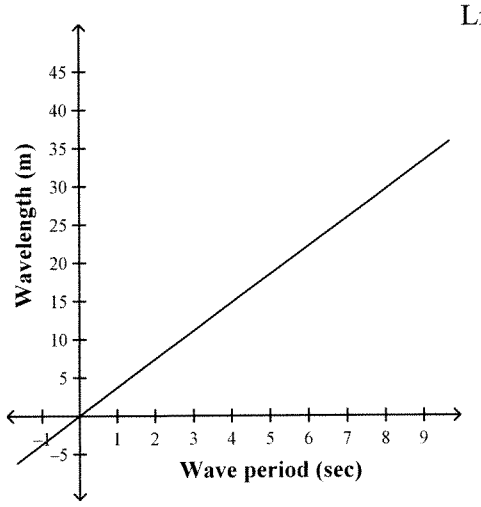
25. In the deep ocean, the length of a wave in meters is related to the period of the wave in seconds. Graph the relationship between wave period and wavelength and identify which parent function best describes it. (Hint: Although time cannot be negative, the negative portion of this function has been provided for you.)

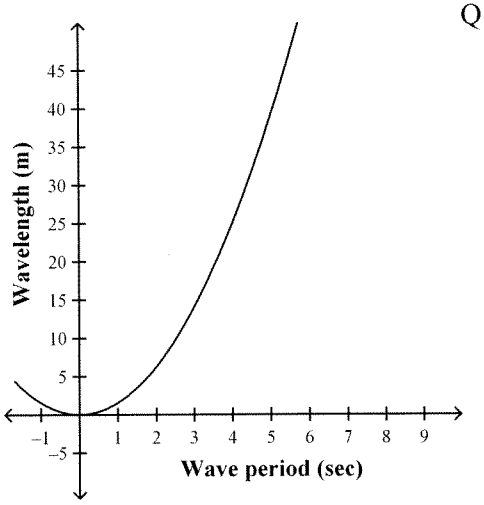
Wave period (sec)	Wavelength (m)
–1	1.56
1	1.56
2	6.24
3	14.04
5	39

A. Li



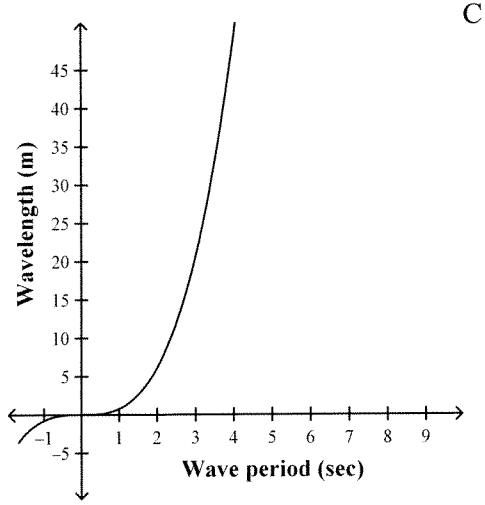
linear parent function

C. Q



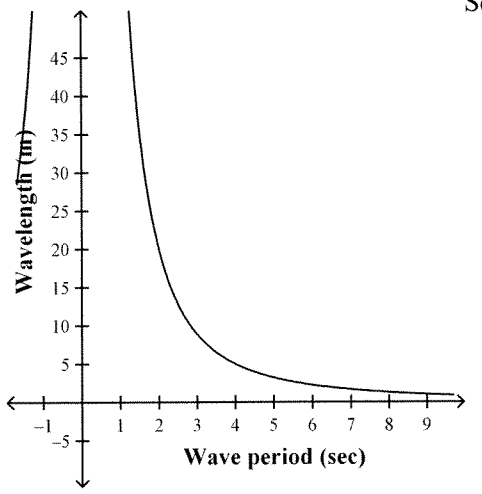
quadratic parent function

B. C



cubic parent function

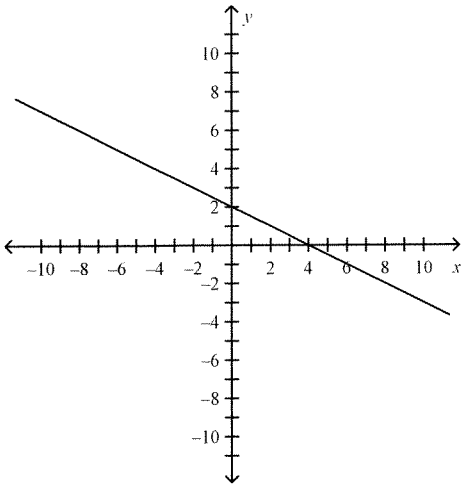
D. Sq



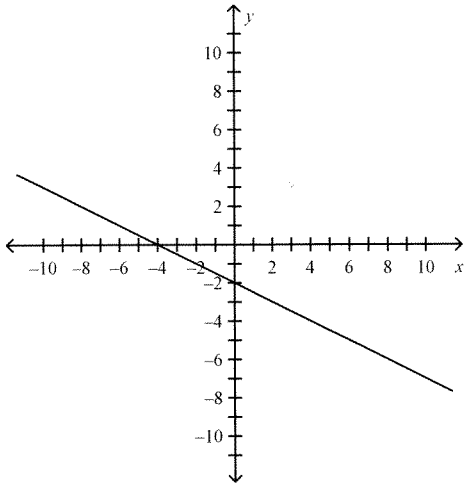
square-root parent function

26. Write the function $5x + 10y = -20$ in slope-intercept form. Then graph the function.

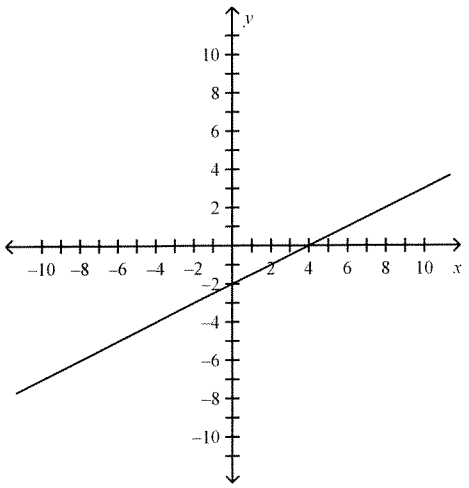
F. $y = -\frac{1}{2}x - 2$



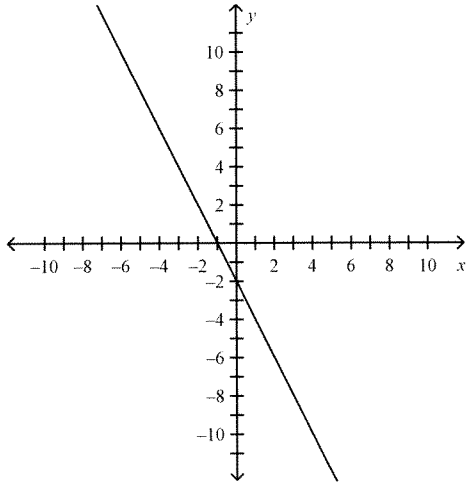
H. $y = -\frac{1}{2}x - 2$



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

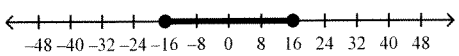


J. $y = -\frac{1}{2}x - 2$

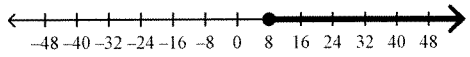


27. Solve $\frac{|x-12|}{4} \leq 1$ and graph the solution set.

A. $-16 \leq x \leq 16$

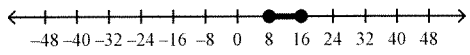


C. $8 \leq x$ and $16 \leq x$



B. $8 \geq x$ and $16 \leq x$
No solution.

D. $8 \leq x \leq 16$



28. Solve the inequality $x^2 + x - 6 \geq -4$ by using a table and a graph.

F. $-2 \leq x \leq 1$

H. $-3 \leq x \leq 2$

G. $x \leq -2$ or $x \geq 1$

J. $x \leq -3$ or $x \geq 2$

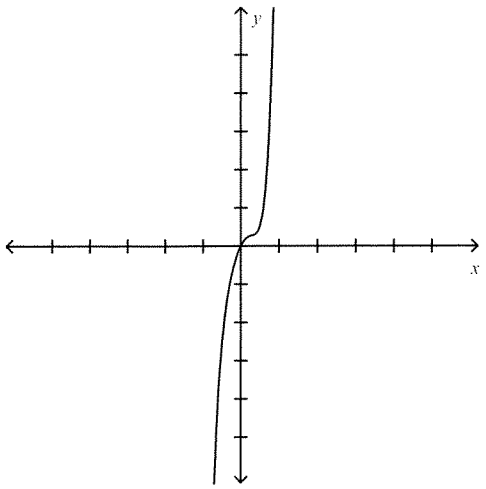
29. Solve the inequality $x^2 - 14x + 45 \leq -3$ by using algebra.

A. $6 \leq x \leq 8$
B. $x \leq 6$ or $x \geq 8$
C. $5 \leq x \leq 9$
D. $x \leq 5$ or $x \geq 9$

30. Find the product $(x - 2y)^3$.

F. $x^3 - 6x^2y + 12xy^2 - 8y^3$
G. $x^3 + 8y^3$
H. $x^3 - 8y^3$
J. $x^3 + 6x^2y + 12xy^2 + 8y^3$

31. Identify whether the function graphed has an odd or even degree and a positive or negative leading coefficient.



A. The degree is odd, and the leading coefficient is negative.
B. The degree is even, and the leading coefficient is negative.
C. The degree is even, and the leading coefficient is positive.
D. The degree is odd, and the leading coefficient is positive.

32. Write the equation of a circle with center (8, 7) and radius $r = 6$.

F. $36 = (x - 8)^2 + (y - 7)^2$
G. $6 = (x - 8)^2 + (y - 7)^2$
H. $6 = (x - 8) + (y - 7)$
J. $36 = (x - 7)^2 + (y - 8)^2$

33. A person is selected at random. What is the probability that the person was not born on a Monday? Express your answer as a percent. If necessary, round your answer to the nearest tenth of a percent.

A. 20.0%
B. 80.0%
C. 14.3%
D. 85.7%

34. Which of the following is true about these two data sets?

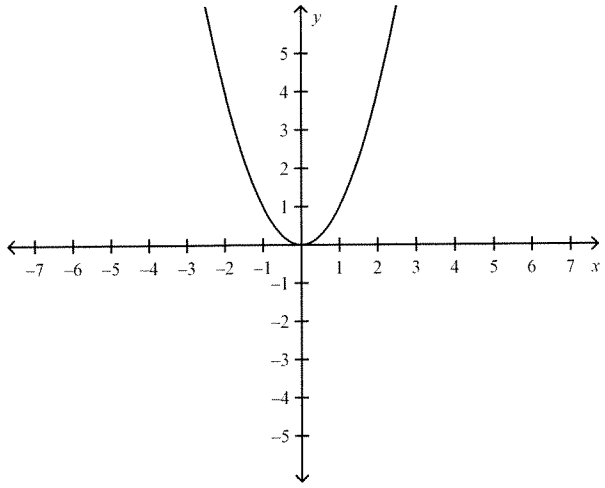
{71, 71, 75, 77, 83, 91, 92} and {73, 75, 76, 76, 83, 87, 90}

F. The ranges are equal.
G. The medians are equal.
H. The means are equal.
J. The variances are equal.

35. Evaluate the series $\sum_{k=1}^{22} k$.

A. 506
B. 253
C. 22
D. 23

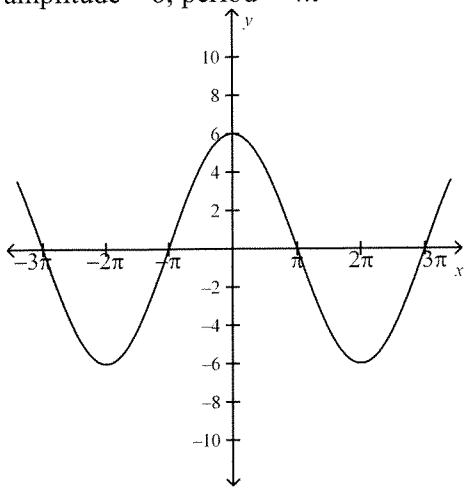
36. Identify whether the function is periodic. If the function is periodic, give the period.



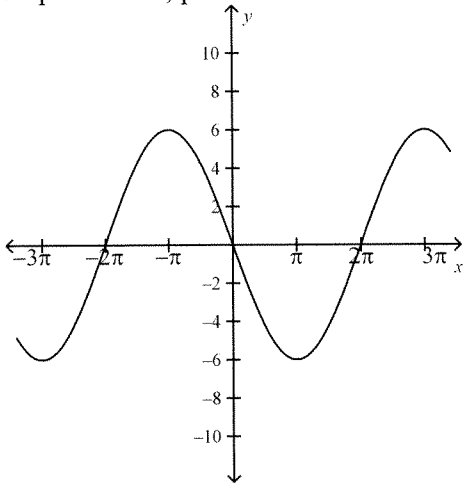
F. The function is not periodic.
G. The function is periodic with period 1.
H. The function is periodic with period 3.
J. The function is periodic with period 2p or about 6.28.

37. Using $f(x) = \cos x$ as a guide, graph $g(x) = 3\cos 4x$. Identify the amplitude and period.

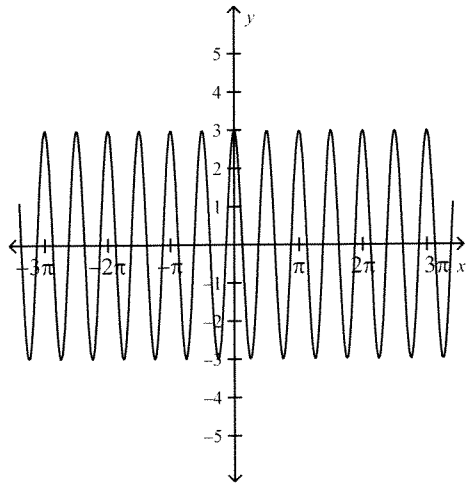
A. amplitude = 6; period = 4π



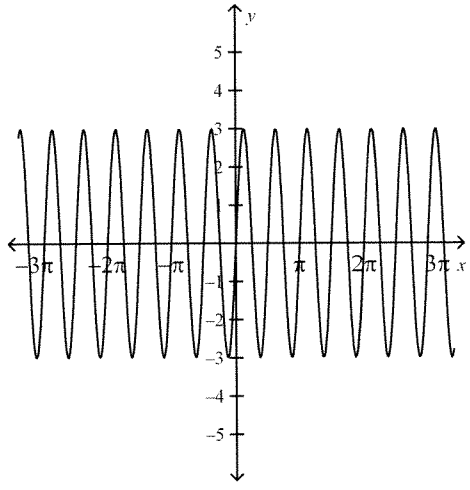
C. amplitude = 6; period = 4π



B. amplitude = 3; period = $\frac{1}{2}\pi$



D. amplitude = 3; period = $\frac{1}{2}\pi$



38. Find $\sin 2\theta$ and $\cos 2\theta$ if $\cos\theta = \frac{1}{4}$ and $0° < \theta < 90°$.

F. $\sin 2\theta = \frac{\sqrt{15}}{8}$; $\cos 2\theta = \frac{7}{8}$

G. $\sin 2\theta = \frac{\sqrt{15}}{8}$; $\cos 2\theta = -\frac{7}{8}$

H. $\sin 2\theta = \frac{3}{4}$; $\cos 2\theta = \frac{1}{2}$

J. $\sin 2\theta = \frac{3}{4}$; $\cos 2\theta = -\frac{1}{2}$

39. Which value of θ is NOT a solution to $\tan^2\theta = \tan\theta$?

A. 0°

B. 45°

C. 135°

D. 180°

40. M is the midpoint of $\overline{AN}$, A has coordinates (–6, –6), and M has coordinates (1, 2). Find the coordinates of N.

F. (8, 10)

G. (–5, –4)

H. $(-2\frac{1}{2}, -2)$

J. $(8\frac{1}{2}, 9\frac{1}{2})$

41. Determine if the biconditional is true. If false, give a counterexample.
A figure is a square if and only if it is a rectangle.

A. The biconditional is true.
B. The biconditional is false. A rectangle does not necessarily have four congruent sides.
C. The biconditional is false. All squares are parallelograms with four 90° angles.
D. The biconditional is false. A rectangle does not necessarily have four 90° angles.

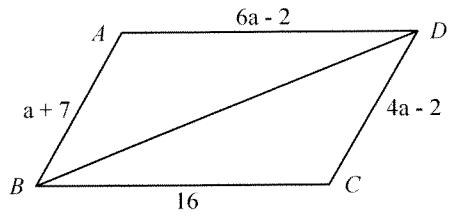
42. Write the equation of the line with slope 2 through the point (4, 7) in point-slope form.

F. $y = 2x - 1$
G. $y = 2x + 7$
H. $y - 4 = 2(x - 7)$
J. $y - 7 = 2(x - 4)$

43. Determine whether the pair of lines $12x + 3y = 3$ and $y = 4x + 1$ are parallel, intersect, or coincide.

A. intersect
B. coincide
C. parallel

44. Show $\Delta ABD \cong \Delta CDB$ for $a = 3$.



Complete the proof.

$AB = a + 7 = [1] = 10$
$CD = 4a - 2 = [2] = 12 - 2 = 10$
$AD = 6a - 2 = 6(3) - 2 = 18 - 2 = [3]$
$CB = [4]$
$\overline{AB} \cong \overline{CD}$. $\overline{AD} \cong \overline{CB}$. $\overline{BD} \cong \overline{BD}$ by the Reflexive Property of Congruence. So $\Delta ABD \cong \Delta CDB$ by [5].

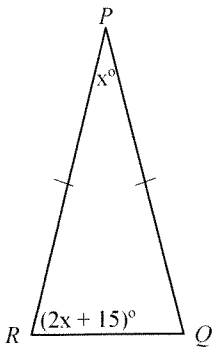
F. [1] $a + 7$
[2] $4a - 2$
[3] 16
[4] 16
[5] SAS

G. [1] $3 + 7$
[2] $4(3) - 2$
[3] 26
[4] 26
[5] SSS

H. [1] $3 + 7$
[2] $4(3) - 2$
[3] 16
[4] 16
[5] SAS

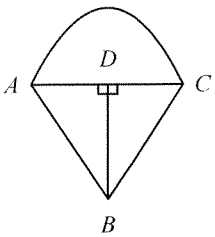
J. [1] $3 + 7$
[2] $4(3) - 2$
[3] 16
[4] 16
[5] SSS

45. Find m$\angle Q$.



A. m$\angle Q = 30°$
B. m$\angle Q = 60°$
C. m$\angle Q = 70°$
D. m$\angle Q = 75°$

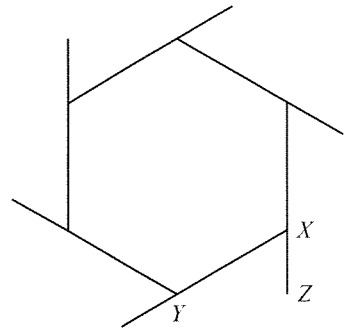
46. Each pair of suspension lines on a parachute are the same length and are equally spaced from the center of the chute. To turn, the sky diver shortens one of the lines. How does this help the sky diver turn?



F. Shortening one line moves the sky diver away from the perpendicular bisector of $\overline{AC}$. This turns the sky diver toward the direction of the shortened line.
G. Shortening one line moves the sky diver closer to the perpendicular bisector of $\overline{AC}$. This turns the sky diver toward the direction of the shortened line.
H. Shortening one line moves the sky diver away from the perpendicular bisector of $\overline{AC}$. This turns the sky diver toward the direction of the longer line.
J. Shortening one line moves the sky diver closer to the perpendicular bisector of $\overline{AC}$. This turns the sky diver toward the direction of the longer line.

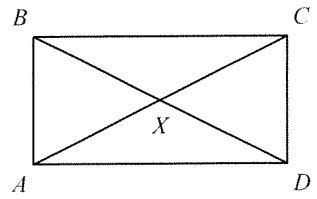
47. Tell whether a triangle can have sides with lengths 1, 2, and 3.
A. No
B. Yes

48. The door on a spacecraft is formed with 6 straight panels that overlap to form a regular hexagon. What is the measure of $\angle YXZ$?



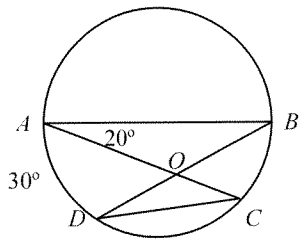
F. $m\angle YXZ = 60°$
G. $m\angle YXZ = 120°$
H. $m\angle YXZ = 720°$
J. $m\angle YXZ = 45°$

49. An artist designs a rectangular quilt piece with different types of ribbon that go from the corner to the center of the quilt. The dimensions of the rectangle are $AB = 10$ inches and $AC = 14$ inches. Find BX.



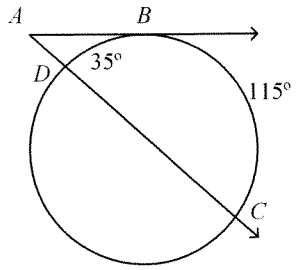
A. $BX = 7$ inches
B. $BX = 10$ inches
C. $BX = 5$ inches
D. $BX = 14$ inches

50. A wheel from a motor has springs arranged as in the figure. Find $m\angle DOC$.



F. $m\angle DOC = 145°$
G. $m\angle DOC = 150°$
H. $m\angle DOC = 140°$
J. $m\angle DOC = 130°$

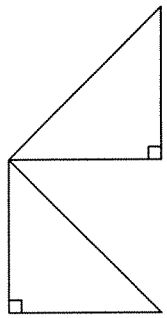
51. Find m$\angle A$.



A. m$\angle A = 40°$
B. m$\angle A = 80°$
C. m$\angle A = 75°$
D. m$\angle A = 20°$

52. Which statement correctly describes a step in the process of drawing a reflection?
F. Through each vertex draw a line perpendicular to the line of reflection.
G. Measure the distance from each vertex to the line of reflection. Locate the image of each vertex on the same side of the line of reflection and the same distance from it.
H. Connect the pre-images of the vertices.
J. Measure the distance from each vertex to the line of reflection. Locate the pre-image of each vertex on the opposite side of the line of reflection and the same distance from it.

53. Tell whether the transformation appears to be a translation. Explain.



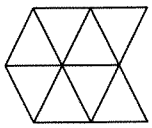
A. Yes; all of the points have moved the same distance in the same direction.
B. No; not all of the points have moved the same distance.

54. Copy the given figure and use it to create a tessellation.

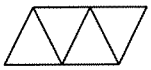
Step 1 Rotate the triangle 180° about the midpoint of one leg of the triangle.
Step 2 Translate the resulting pair of triangles to make a row of triangles.
Step 3 Translate the row of triangles to make a tessellation.

Which of the following tessellations can you create from these steps?

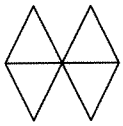
F.



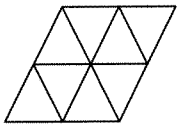
H.



G.

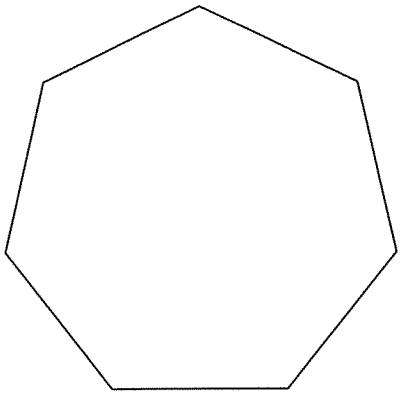


J.

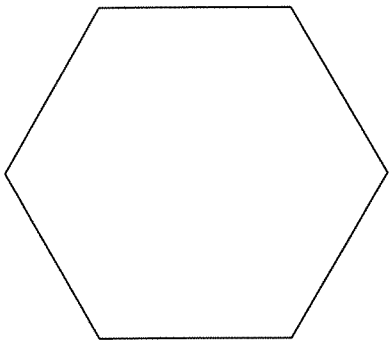


55. Determine which of the following polygons cannot be used to form a tessellation.

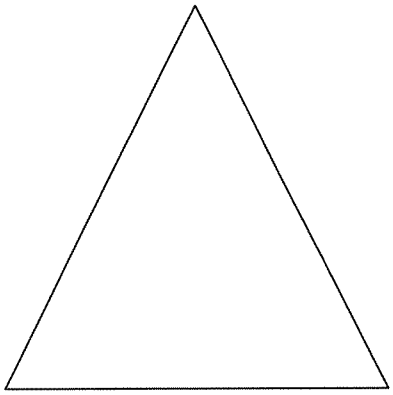
A. regular heptagon



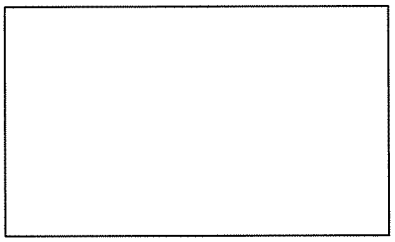
B. regular hexagon



C. regular triangle



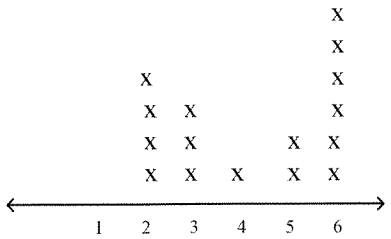
D. rectangle



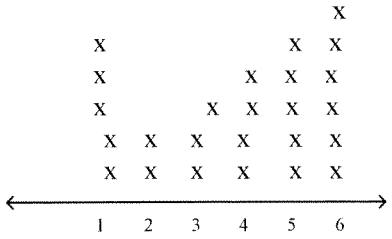
56. Draw a line plot for the frequency table.

Number	1	2	3	4	5	6
Frequency	4	5	3	2	2	6

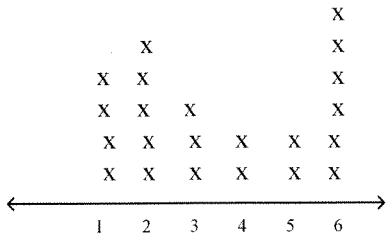
F.



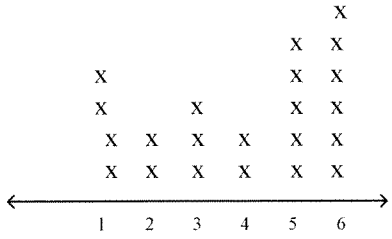
H.



G.



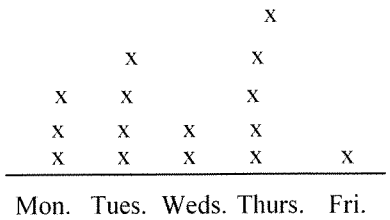
J.



57. Find the range of the data.
Scores: 90, 89, 87, 79, 89, 84, 80, 85, 85, 79

A. 11 **B.** 7 **C.** 12 **D.** 15

58. The line plot shows on which day of the week you and your classmates were born. Which statement is NOT true?

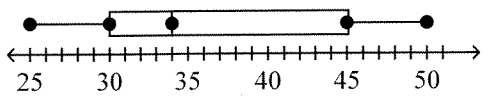


F. Two students were born on a Wednesday.
G. There are 15 students in your class.
H. More students were born on a Tuesday than on a Monday.
J. The range of the data is 5.

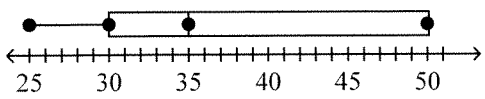
Draw the box-and-whisker plot for the data.

59. 33, 50, 30, 45, 30, 41, 27, 34, 50, 49, 40, 40, 35, 25, 28

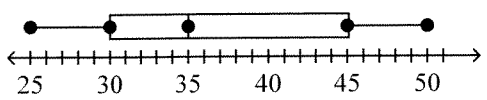
A.



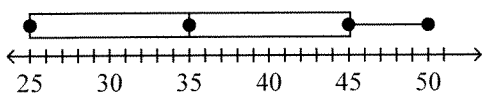
C.



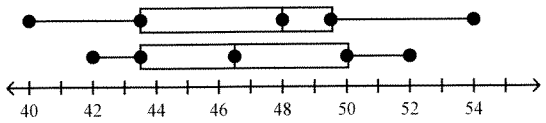
B.



D.

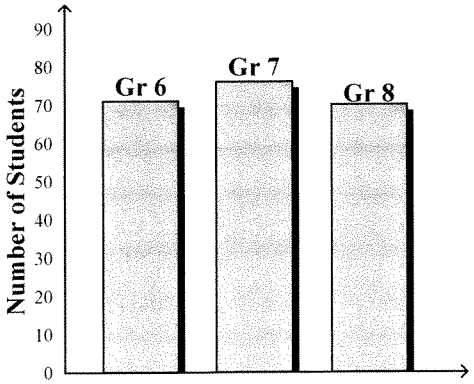


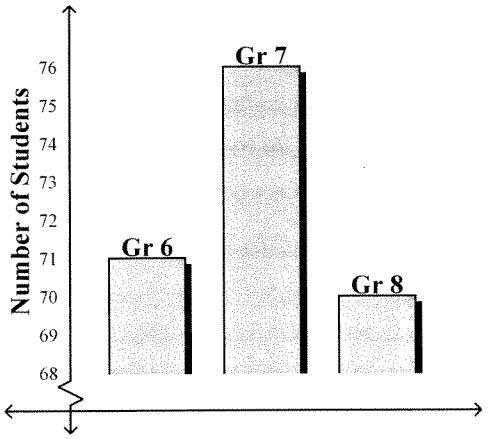
60. Use the two box-and-whisker plots to determine which statement is true.



F. They have the same median.
G. They have the same range.
H. The upper quartiles are equal.
J. The lower quartiles are equal.

61. The graphs show the number of students receiving A's in each grade at Glenwood Middle School. Which statement is true?



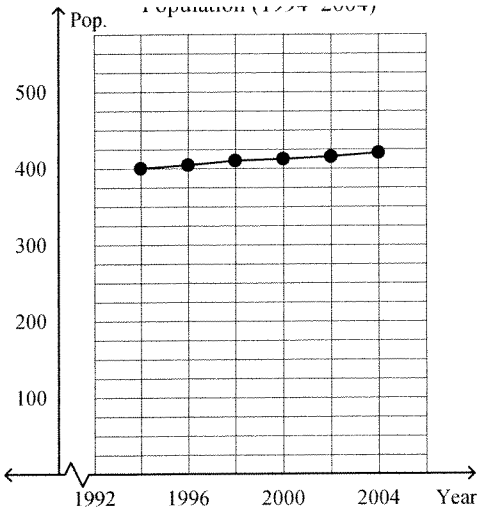


A. The second graph shows greater changes in the number of A's than the first graph.
B. The second graph exaggerates the differences between the numbers of A's.
C. The two graphs are exactly the same.
D. The scale of the first graph exaggerates the number of A's because it starts at zero.

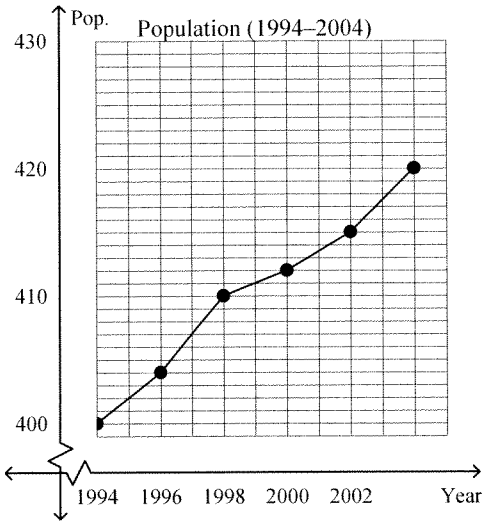
62. Use the data in the table. Make a graph that suggests a rapid increase in population from 1994 to 2004.

Year	Population
1994	400
1996	404
1998	410
2000	412
2002	415
2004	420

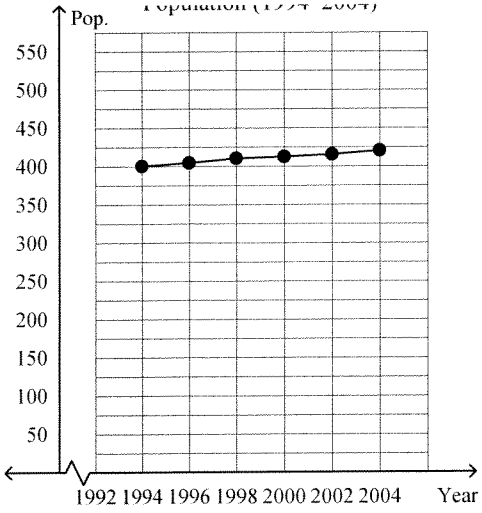
F.



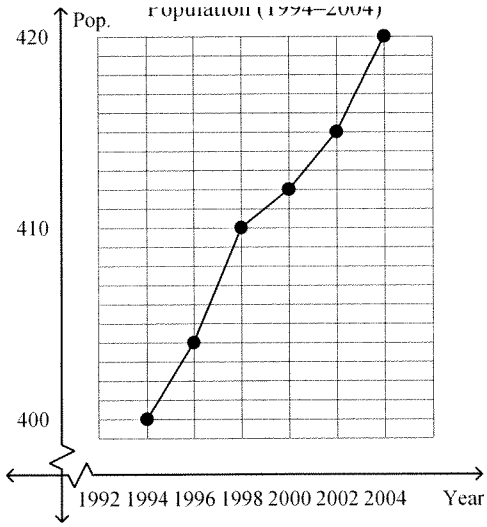
H.



G.

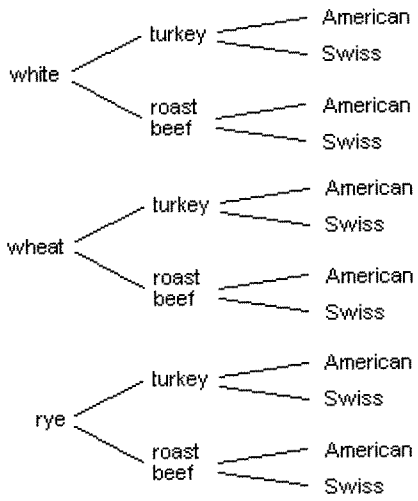


J.

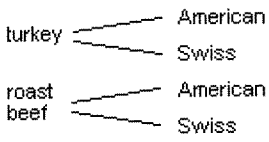


63. A sandwich is made with only one type of bread, one type of meat, and one type of cheese. There are 3 types of bread: white, wheat, or rye; 2 types of meat: turkey or roast beef; and 2 types of cheese: American or Swiss. Draw a tree diagram to show the number of sandwich choices.

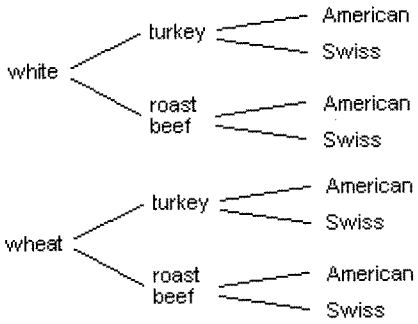
A.



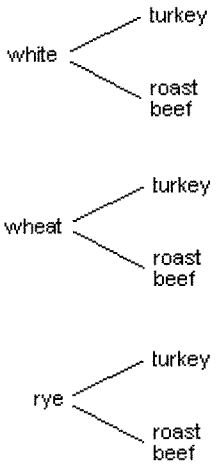
B.



C.



D.



64. Ms. Wong is redecorating her office. She has a choice of 7 colors of paint, 4 kinds of curtains, 3 colors of carpet, and 2 styles of furniture. How many different ways are there to redecorate if she can choose two different colors of paint, one kind of curtain, one color of carpet, and one style of furniture?

F. 168 ways **G.** 1,008 ways **H.** 1,176 ways **J.** 23 ways

65. There are many different license-plate systems being used in the United States. Which system provides for the greatest possible number of license plates?

A. License plates display three letters and three digits.
B. License plates display two letters and four digits.
C. License plates display five letters.
D. License plates display four letters and two digits.

66. Suppose x coins are tossed. Write an expression to represent the number of possible outcomes.

F. 2^x **G.** $x + x$ **H.** $x \cdot x$ **J.** $2x$

Use the Counting Principle to find the probability.

67. choosing the 8 winning lottery numbers when the numbers are chosen at random from 0 to 9

A. $\frac{1}{10,000,000}$ **B.** $\frac{1}{1,000,000,000}$ **C.** $\frac{1}{100,000,000}$ **D.** $\frac{1}{43,046,721}$

68. rolling a 4 on each of 4 number cubes

F. $\frac{1}{1,296}$ **G.** $\frac{1}{24}$ **H.** $\frac{1}{324}$ **J.** $\frac{2}{3}$

69. Jason and Kyle both choose a number from 1 to 10 at random. What is the probability that both numbers are odd?

A. $\frac{1}{3}$ **B.** $\frac{1}{2}$ **C.** $\frac{1}{4}$ **D.** $\frac{1}{8}$

70. Which describes independent events?

F. You grab two jelly beans from a jar at the same time.
G. You draw a card from a deck, replace it, and draw a second.
H. You draw a card and do not replace it. Then you draw another.
J. You study English every night, and then you get an A on the next test.

71. Find the probability that 3 students chosen at random were all born on a Wednesday.

A. $\frac{3}{343}$ **B.** $\frac{1}{343}$ **C.** $\frac{1}{27}$ **D.** $\frac{1}{21}$

72. A local weather forecaster is accurate 85% of the time when predicting precipitation for the day. What is the probability that she will make correct precipitation predictions 4 days in a row? Round to the nearest whole percent.

F. about 54% **G.** about 53% **H.** about 52% **J.** about 47%

You select a card at random. Without replacing the card, you select a second card. Find the probability.

M	A	T	H	E	M	A	T	I	C	S

73. P(M, then H)

A. $\frac{3}{11}$ **B.** $\frac{2}{21}$ **C.** $\frac{1}{55}$ **D.** $\frac{2}{121}$

74. P(T, then a vowel)

F. $\frac{3}{55}$ **G.** $\frac{8}{121}$ **H.** $\frac{6}{121}$ **J.** $\frac{4}{55}$

75. P(C, then T or S)

A. $\frac{3}{110}$ **B.** $\frac{4}{110}$ **C.** $\frac{3}{121}$ **D.** $\frac{4}{11}$

76. In how many different ways can you arrange 7 books on a shelf?
F. 823,543 ways **G.** 5,040 ways **H.** 720 ways **J.** 28 ways

77. How many permutations can be made using the letters S, T, U, D, Y, H, A, R, D?
A. 1 permutation **C.** 9 permutations
B. 362,880 permutations **D.** 456,225 permutations

78. In how many ways could you choose two different letters from the letters M, A, T, H?
F. 12 ways **G.** 24 ways **H.** 6 ways **J.** 18 ways

79. A panel of judges must consist of four women and three men. A list of potential judges includes six women and five men. How many different panels could be created from this list?
A. 30 panels **B.** 150 panels **C.** 25 panels **D.** 300 panels

Does the problem involve *permutations* or *combinations*? Explain.

80. In how many different ways could a committee of 5 students be chosen from a class of 25 students?
F. Permutations; the order matters.
G. Permutations; the order does not matter.
H. Combinations; the order does not matter.
J. Combinations; the order matters.

81. In how many ways could six horses come in first, second or third in a race?
A. Combinations; the order does not matter.
B. Combinations; the order matters.
C. Permutations; the order does not matter.
D. Permutations; the order matters.

82. In your last 23 basketball games, you attempted 101 free throws and made 66. Find the experimental probability that you make a free throw. Write the probability as a percent, to the nearest tenth of a percent.
F. 65.3% **G.** 69.8% **H.** 69.7% **J.** 65.7%

83. You work at a T-shirt printing business. Of the 2,800 T-shirts shipped, 396 have a defect. What is the experimental probability that a T-shirt has a defect? Write your answer as a percent, to the nearest tenth of a percent.
A. 15.3% **B.** 14.1% **C.** 11.7% **D.** 19.4%

Is the sample described a good sample? Explain.

84. To find the average age of drivers in a particular city, use all the names of people with driver's licenses put into a file. One hundred names are picked blindly from the file as a sample.
F. No; the sample is not selected from the population to be studied.
G. No; the sample is not random.
H. Yes; the sample is selected at random from the population to be studied.

85. To find the average income of an adult in the United States, 250 workers in Tennessee are questioned.
A. No; the sample is not random.
B. Yes; the sample is selected at random from the population to be studied.
C. No; the sample is not selected from the population to be studied.

86. To find the average number of shoppers in a particular store, shoppers are counted on two consecutive Saturday mornings.
F. No; the sample is not selected from the population to be studied.
G. No; the sample is not random.
H. Yes; the sample is selected at random from the population to be studied.

87. A worker takes a random sample of 200 bolts and finds that 30 of them are either too long or too short, thus making them unusable. Estimate the number of unusable bolts in a production of 17,000 bolts.
A. 1,610 bolts **B.** 2,550 bolts **C.** 2,140 bolts **D.** 2,260 bolts

88. Out of a random sample of 330 apples, 25 are rated "AAA." Estimate the number of apples that would be rated "AAA" in a crop of 57,000 apples.
F. about 432 apples
G. about 4,318 apples
H. about 43,180 apples
J. about 8,636 apples

Write the fraction in simplest form.

89. $\frac{18}{30}$
A. $\frac{3}{5}$ **B.** $\frac{9}{16}$ **C.** $\frac{4}{7}$ **D.** $\frac{2}{3}$

90. Identify the fraction that is equivalent to $\frac{2}{7}$.
F. $\frac{8}{28}$ **G.** $\frac{8}{21}$ **H.** $\frac{6}{28}$ **J.** $\frac{10}{28}$

Name: _____ ID: A

Use the spreadsheet.

All-Time Winningest Teams

	A	B	C	D	E	F	G
1	**Team**	**Year**	**Won**	**Lost**	**Total Games Played**	**Winning Percentage**	
2	Pirates	1972	29	2	31	.935	
3	Cougars	1994	32	5	☐	.865	
4	Hawks	2003	22	☐	26	.846	
5	Mustangs	1989	30	6	36	☐	
6		**totals:**	113	☐	☐	**Combined Winning Percentage:**	**.869**

91. Write the expression you would enter for the formula that will calculate the value in cell E6.

A. =C5-D5
B. =E6
C. =E2+E3+E4+E5
D. =C5*G5

92. In which cell of the spreadsheet would you find the formula =E4-C4?

F. G6
G. D4
H. G4
J. none of these

93. $\frac{6}{10} - \frac{1}{3} =$

A. $1\frac{9}{10}$ **B.** $\frac{4}{15}$ **C.** $\frac{14}{15}$ **D.** $\frac{1}{6}$

94. $6\frac{1}{3} + 5\frac{5}{6} =$

F. $11\frac{4}{27}$ **G.** $12\frac{1}{6}$ **H.** $11\frac{8}{15}$ **J.** $12\frac{10}{27}$

95. $8\frac{3}{4} - 4\frac{1}{4} =$

A. $4\frac{1}{16}$ **B.** $4\frac{9}{16}$ **C.** $4\frac{1}{2}$ **D.** $4\frac{1}{4}$

96. $\frac{3}{6} \times \frac{7}{10} =$

F. $\frac{7}{20}$ **G.** $2\frac{1}{10}$ **H.** $\frac{5}{7}$ **J.** $3\frac{1}{2}$

97. $\frac{5}{12} \div \frac{2}{8} =$

A. $3\frac{1}{3}$ **B.** $1\frac{2}{3}$ **C.** 20 **D.** $\frac{5}{48}$

Write as a decimal.

98. $3\frac{2}{5}$

F. 0.4 **G.** 5.5 **H.** 3.4 **J.** 1.2

Write as a fraction in simplest form.

99. 0.68

A. $\frac{68}{99}$ **B.** $\frac{99}{68}$ **C.** $\frac{17}{25}$ **D.** $\frac{3}{5}$

100. 0.515151. . .

F. $\frac{1}{2}$ **G.** $\frac{17}{33}$ **H.** $\frac{51}{1000}$ **J.** $\frac{51}{100}$

Write as a percent.

101. 0.63

A. 0.063% **B.** 6.3% **C.** 630% **D.** 63%

102. Write 60% as a fraction or mixed number in simplest form.

F. $1\frac{2}{3}$ **G.** $\frac{3}{5}$ **H.** 6 **J.** $\frac{1}{6}$

103. Is 112 prime or composite?

A. composite **B.** prime

Find the greatest common factor of the numbers.

104. 24 and 54

F. 2 **G.** 7 **H.** 6 **J.** 3

105. 6, 21, and 36

A. 3 **B.** 5 **C.** 7 **D.** 6

Find the least common multiple of the set of numbers.

106. 6 and 10

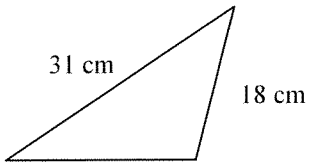
F. 15 **G.** 30 **H.** 60 **J.** 45

107. 4, 9, and 16

A. 576 **B.** 288 **C.** 144 **D.** 72

Find the perimeter of the figure.

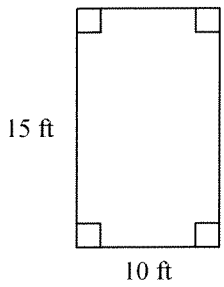
108.



Drawing not to scale

F. 74 cm **G.** 80 cm **H.** 68 cm **J.** 87 cm

109.

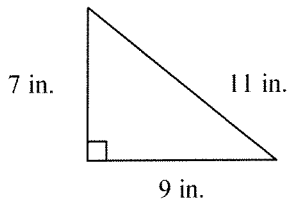


Drawing not to scale

A. 25 ft **B.** 60 ft **C.** 50 ft **D.** 150 ft

Find the area of the figure.

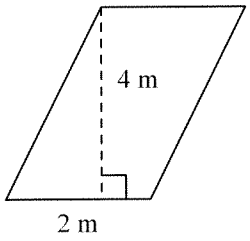
110.



Drawing not to scale

F. 31.5 $in.^2$ **G.** 173.3 $in.^2$ **H.** 27 $in.^2$ **J.** 63 $in.^2$

111.

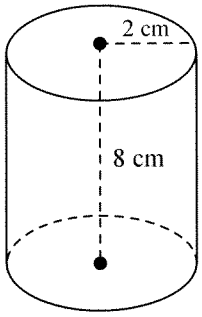


Drawing not to scale

A. 8 m^2 **B.** 16 m^2 **C.** 4 m^2 **D.** 12 m^2

Find the surface area of the figure. Round final answers to the nearest tenth if necessary.

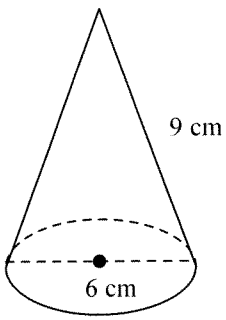
112.



Drawing not to scale

F. 75.4 cm^2 **G.** 113 cm^2 **H.** 125.6 cm^2 **J.** 226.1 cm^2

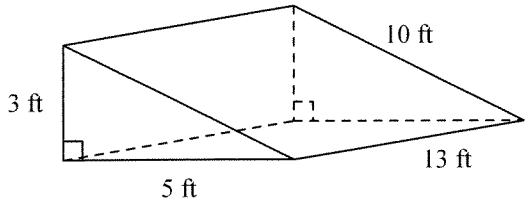
113.



Drawing not to scale

A. 65.9 cm^2 **B.** 141.3 cm^2 **C.** 113 cm^2 **D.** 282.6 cm^2

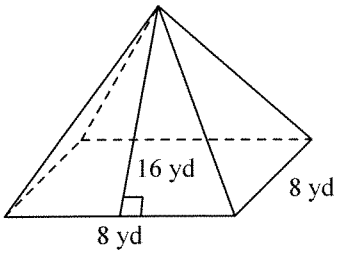
114.



Drawing not to scale

F. 241.5 ft^2 **G.** 264 ft^2 **H.** 249 ft^2 **J.** 195 ft^2

115.

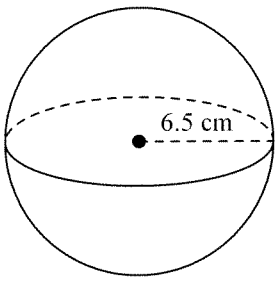


Drawing not to scale

A. 128 yd^2 **B.** 320 yd^2 **C.** 192 yd^2 **D.** 576 yd^2

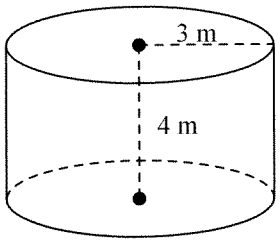
Find the volume of the solid. Round to the nearest tenth if necessary.

116.



F. 3449.3 cm^3 **G.** 176.9 cm^3 **H.** 646.7 cm^3 **J.** 1149.8 cm^3

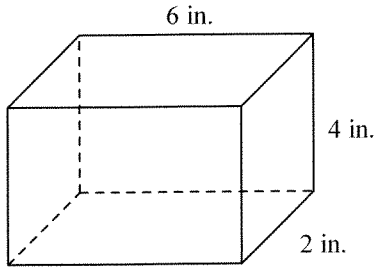
117.



Drawing not to scale

A. 226.1 m^3 **B.** 37.7 m^3 **C.** 113 m^3 **D.** 150.7 m^3

118.



Drawing not to scale

F. 24 $in.^3$ **G.** 96 $in.^3$ **H.** 48 $in.^3$ **J.** 16 $in.^3$

119. A car travels 497 miles in 8 hours. Find the unit rate. Round to the nearest tenth if necessary.

A. 1.6 miles per hour
B. 52.8 miles per hour
C. 77.7 miles per hour
D. 62.1 miles per hour

120. An athlete runs a 900-meter course in 180 seconds. Find the average speed of the athlete. Round to the nearest tenth if necessary.

F. 0.2 meters per second
G. 0.3 meters per second
H. 5 meters per second
J. 4 meters per second

121. A rectangular prism has a surface area of 40 $in.^2$. If all of the dimensions of the prism are tripled, what is the surface area of the larger prism?

A. 360 $in.^2$ **B.** 120 $in.^2$ **C.** 240 $in.^2$ **D.** 1080 $in.^2$

122. A cylinder has a volume of 19 cm^3. If the radius is doubled, what is the volume of the new cylinder?

F. 304 cm^3 **G.** 38 cm^3 **H.** 76 cm^3 **J.** 152 cm^3

123. A large aquarium is 8 m by 6 m by 5 m. What is the difference in the volume of the aquarium if its dimensions are doubled?

A. 240 m^3 **B.** 1680 m^3 **C.** 360 m^3 **D.** 480 m^3

124. Write a rule to describe the translation $P(3,-6) \rightarrow P'(9,-3)$.

F. 6 units right, 3 units up
G. 6 units left, 3 units down
H. 6 units left, 3 units up
J. 6 units right, 3 units down

125. Two cars started from the same point. One traveled north at 45 mi/h and the other traveled south at 65 mi/h. How far apart were the cars after 3 hours?

A. 110 mi **B.** 390 mi **C.** 330 mi **D.** 270 mi

126. Bonnie, Jason, Melda, Kenji, Tanya, and Darren form a chess club. They each want to play one game with every other member of the club. How many games will be played?

F. 16 **G.** 36 **H.** 6 **J.** 15

127. Tammy is selling tickets for the school jazz band concert. Adult tickets cost \$5, and student tickets cost \$3. If Tammy sells a total of 170 tickets and collects \$650, how many of each kind of ticket did she sell?

A. 70 adult, 100 student
B. 75 adult, 95 student
C. 95 adult, 75 student
D. 100 adult, 70 student

128. Marcus has 68 feet of fencing. He wants to build a rectangular pen with the largest possible area. What should the dimensions of the rectangle be?

F. 19 ft by 21 ft
G. 21 ft by 13 ft
H. 17 ft by 17 ft
J. 19 ft by 15 ft

129. There are 60 pages in your journal. If you number all of the pages, starting with 1, how many digits will you have to write?

A. 62 **B.** 120 **C.** 111 **D.** 60

130. There are 22 students in your homeroom class. There are 9 who are in the jazz ensemble, 6 students who play soccer, and 2 students who are in both groups. How many students are not in either group?

F. 11 **G.** 7 **H.** 9 **J.** 8

131. You bake cookies for a school fundraiser. In the morning, you sell 6 cookies. During lunch, you sell one-half of the cookies you have left. In the afternoon, you sell 19 cookies. If you are left with 6 cookies at the end of the day, how many cookies did you start with?

A. 68 **B.** 62 **C.** 56 **D.** 50

132. Sasha returned home from mowing lawns at 4:15 P.M. It took 1 h to mow the first lawn. The second lawn took 1 h. She took a 30-min break between the two lawns. When did Sasha begin mowing the first lawn?

F. 1:45 P.M. **G.** 2:30 P.M. **H.** 2:00 P.M. **J.** 2:15 P.M.

133. For $A = \begin{bmatrix} 10 & -6 \\ 12 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -6 & 2 \\ -5 & 3 \end{bmatrix}$, find $A + B$.

A. $\begin{bmatrix} -4 & 21 \\ 9 & 4 \end{bmatrix}$ **B.** $\begin{bmatrix} 4 & -4 \\ 7 & 3 \end{bmatrix}$ **C.** $\begin{bmatrix} 4 & -12 \\ 12 & -5 \end{bmatrix}$ **D.** $\begin{bmatrix} 16 & -8 \\ 17 & -3 \end{bmatrix}$

134. For $A = \begin{bmatrix} 2 & -10 \\ 5 & 2 \end{bmatrix}, B = \begin{bmatrix} -5 & 2 \\ -8 & -10 \end{bmatrix}$, and $C = \begin{bmatrix} -10 & -4 \\ 6 & 4 \end{bmatrix}$, find $-2A - B + C$.

F. $\begin{bmatrix} -4 & 12 \\ 12 & 20 \end{bmatrix}$ **G.** $\begin{bmatrix} 11 & 22 \\ -8 & 2 \end{bmatrix}$ **H.** $\begin{bmatrix} -9 & 14 \\ 4 & 10 \end{bmatrix}$ **J.** $\begin{bmatrix} -13 & -12 \\ 3 & -4 \end{bmatrix}$

Name the property that the statement(s) illustrates.

135. If $-b = 14$, then $14 = -b$.

A. Commutative Property of Multiplication
B. Reflexive Property
C. Symmetric Property
D. Transitive Property

136. If $d = \frac{9}{f}$ and $\frac{9}{f} = 4$ then $d = 4$.

F. Inverse Property of Multiplication
G. Symmetric Property
H. Transitive Property
J. Reflexive Property

137. $-t = -t$

A. Symmetric Property
B. Reflexive Property
C. Transitive Property
D. Associative Property of Multiplication

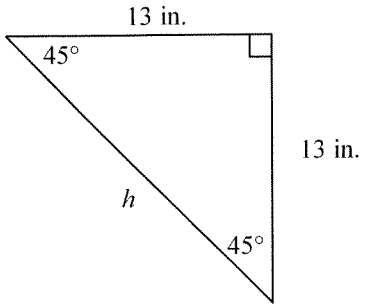
138. If $q < 2^5$ and $2^5 < r$, then $q < r$

F. Multiplication Property of Inequality
G. Reflexive Property
H. Symmetric Property
J. Transitive Property

Name: _____ ID: A

Find the missing length(s) of the triangle. Round to the nearest tenth.

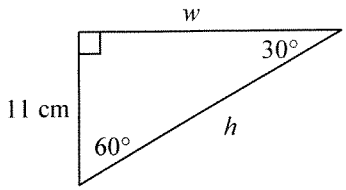
139.



Drawing not to scale

A. $h = 6.5$ in. **B.** $h = 22.5$ in. **C.** $h = 26.0$ in. **D.** $h = 18.4$ in.

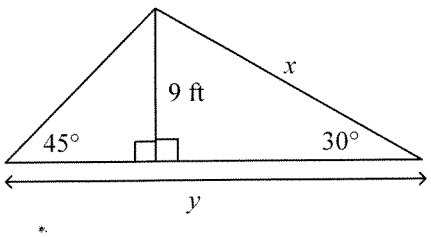
140.



Drawing not to scale

F. $h = 22$ cm, $w = 15.6$ cm
G. $h = 19.1$ cm, $w = 15.6$ cm
H. $h = 22$ cm, $w = 19.1$ cm
J. $h = 19.1$ cm, $w = 19.1$ cm

141.



Drawing not to scale

A. $x = 15.6$ ft, $y = 21.7$ ft
B. $x = 18.0$ ft, $y = 24.6$ ft
C. $x = 15.6$ ft, $y = 18.0$ ft
D. $x = 15.6$ ft, $y = 24.6$ ft

Simplify the expression.

142. $64^{\frac{1}{3}}$

F. 192 **G.** 4 **H.** 262,144 **J.** 21

143. $4^{\frac{3}{2}}$

A. 3 **B.** 6 **C.** 3 **D.** 8

144. $\left(x^{\frac{4}{5}}\right)^{\frac{1}{2}}$

F. x^5 **G.** $x^{\frac{2}{5}}$ **H.** $x^{\frac{8}{5}}$ **J.** $x^{\frac{5}{7}}$

145. $\left(z^{\frac{4}{5}}\right)\left(z^{\frac{3}{10}}\right)$

A. x^{11} **B.** $x^{\frac{7}{15}}$ **C.** $x^{\frac{11}{10}}$ **D.** $x^{\frac{12}{50}}$

146. $\frac{7}{13}+\frac{16}{13}-\frac{8}{13}$

F. $2\frac{5}{13}$ **G.** $-1\frac{2}{13}$ **H.** $1\frac{2}{13}$ **J.** $-1\frac{4}{13}$

147. $-\frac{17}{9}-\frac{14}{8}$

A. $-\frac{31}{72}$ **B.** $-3\frac{23}{36}$ **C.** $-1\frac{14}{17}$ **D.** 238

148. $\frac{3}{7}-\frac{4}{m}$

F. $\frac{3m-28}{7m}$ **G.** $-\frac{1}{7m}$ **H.** $-\frac{25}{7m}$ **J.** $-\frac{25}{7}$

149. $13\frac{1}{3}-7\frac{7}{9}$

A. $5\frac{5}{9}$ **B.** $6\frac{8}{27}$ **C.** $6\frac{2}{3}$ **D.** 7

150. $5\frac{1}{3}+\left(-3\frac{9}{18}\right)$

F. $1\frac{5}{6}$ **G.** $2\frac{8}{15}$ **H.** $3\frac{8}{13}$ **J.** $8\frac{5}{6}$

151. $\left(2n^4h^3\right)^4$

A. $2nh^{28}$ **B.** $2nh^{11}$ **C.** $16n^8h^7$ **D.** $16n^{16}h^{12}$

152. Convert 2 qt/min to gallons per hour.

F. 8 gal/h **G.** 120 gal/h **H.** 30 gal/h **J.** 3 gal/h

153. Convert 50 mi/h to feet per minute.

A. 4,400 ft/min **B.** 3,000 ft/min **C.** 1,200 ft/min **D.** 6,636 ft/min

154. One hundred nautical miles equals about 185 kilometers. To the nearest kilometer, how far in kilometers is 290 nautical miles?

F. 537 km **G.** 157 km **H.** 185 km **J.** 53,650 km

155. Write a proportion that can be used to find the cost of 10 notebooks if 3 notebooks cost \$1.98.

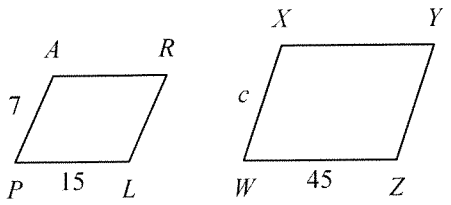
A. $\frac{3}{10} = \frac{n}{\$1.98}$ **C.** $\frac{10}{3} = \frac{\$1.98}{n}$

B. $\frac{10}{\$1.98} = \frac{n}{3}$ **D.** $\frac{3}{\$1.98} = \frac{10}{n}$

156. Carpet Masters charges \$9.50 per square yard to clean a carpet. If you have two rooms with an area of six square yards each, how much will it cost to have the carpets cleaned?

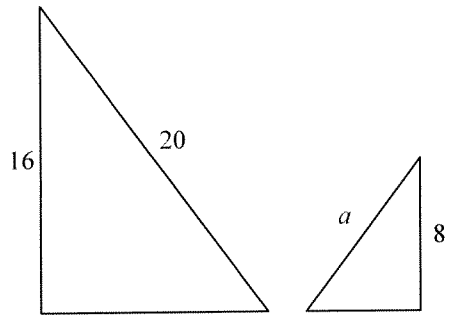
F. \$3.17 **G.** \$114 **H.** \$228 **J.** \$342

157. Parallelogram *PARL* ~ parallelogram *WXYZ*. Find the value of *c*.



A. 45 **B.** 21 **C.** 3 **D.** 22

158. The triangles are similar. Find the value of a.



F. 12 **G.** 6 **H.** 10 **J.** 16

159. Gretchen is using an overhead projector to enlarge a drawing so she can make a poster. The original drawing measures 60 mm wide by 80 mm high. She moves the projector so that the width of the projected image is 300 mm. If the original drawing and the projected image are similar figures, what will be the height of the projected image?

A. 440 mm **B.** 225 mm **C.** 180 mm **D.** 400 mm

160. The scale on a map is 1 cm : 6 km. If two cities are 13 cm apart on the map, what is the actual distance between the cities?

F. 13 km **G.** 468 km **H.** 2.17 km **J.** 78 km

161. Emma already has read 6 of 20 books on her summer reading list. What percent of the books on her list has she read already?

A. 23.1% **B.** 30.0% **C.** 333.3% **D.** 0.3%

162. 20 is 50% of what number? If necessary, round to the nearest tenth.

F. 10.0 **G.** 1000.0 **H.** 40.0 **J.** 0.4

163. The Mogul Runners ski club planned a trip to Park City. Of the total number of members belonging, 11 signed up to go. If this is 25% of the club, how many total members does the ski club have?

A. 22 members **B.** 3 members **C.** 275 members **D.** 44 members

164. Martha paid $42.40 for her sister's birthday present. This included 6% sales tax. What was the cost of the gift before tax?

F. $40.00 **G.** $44.94 **H.** $25.44 **J.** $2.40

Write the percent as a fraction or mixed number in simplest form.

165. 155%

A. $4\frac{1}{2}$ **B.** $15\frac{1}{2}$ **C.** $1\frac{11}{20}$ **D.** $\frac{9}{20}$

166. Write 88.2% as a decimal.

F. 8.82 **G.** 882 **H.** 0.882 **J.** 8,820

Write an equation and solve. Round to the nearest tenth where necessary.

167. 19 is what percent of 40?
A. $19 = n \cdot 40$; 47.5%
B. $40 = 19 \cdot n$; 2.1%
C. $40 = 19 \cdot n$; 40.4%
D. $19 = n \cdot 40$; 52.3%

168. 64 is 80% of what?
F. $64 \cdot n = 80$; 0.8
G. $0.64 \cdot n = 80$; 125
H. $60 = 0.80 \cdot n$; 80
J. $80 = 64 \cdot n$; 1.3

169. Tamika makes a 5.5% commission selling electronics. How much commission does she make if she sells a flat-screen TV for $10,000?
A. $9,450 **B.** $550 **C.** $55,000 **D.** $1,818.18

170. In a survey, 480 people, or 75%, said they attended a movie at least once a month. How many people were surveyed?
F. 405 people **G.** 360 people **H.** 555 people **J.** 640 people

171. Find the percent of increase from 320 to 380. Round to the nearest tenth of a percent if necessary.
A. 18.8% **B.** 84.2% **C.** 15.8% **D.** 0.2%

172. The circulation of a newsletter decreased from 3,200 to 2,464. What was the percent of decrease in circulation?
F. 129% **G.** 77% **H.** 2.3% **J.** 23%

173. Wren bought a baseball card last year for $2.25. This year the price dropped to $.45. What was the percent of decrease in the price of the card?
A. 80% **B.** 500% **C.** 120% **D.** 400%

174. A toy store's percent of markup is 35%. A model train costs the store $100. Find the markup.
F. $135 **G.** $35 **H.** $285.71 **J.** $65

175. A sporting goods store pays $180 for a rubber raft. The percent of markup is 40%. Find the raft's selling price.
A. $72 **B.** $108 **C.** $252 **D.** $450

176. At the beginning of 1995, the town of Canyon Ridge had 1,700 residents. The rate of population growth after that was 6% per year. Estimate the population at the beginning of 2005.
F. about 102 residents
G. about 3,044 residents
H. about 3,502 residents
J. about 1,802 residents

177. Soren placed $750 in a certificate of deposit (CD) with an interest rate of 3.5%. At the end of each year, the CD earns interest on the total amount including interest earned in previous years. How much money will there be after 5 interest payments?
A. $131.25 **B.** $881.25 **C.** $1,312.50 **D.** $890.76

Find the least common multiple.

178. $10x$ and $45x^4$

F. $90x^4$ **G.** $450x^4$ **H.** $90x^5$ **J.** $5x$

179. $3x^2$, $12y$, and $10x^3y^3$

A. $60x^3y^3$ **B.** $60x^5y^4$ **C.** $25x^5y^4$ **D.** $360x^3y^3$

180. Anita owns a beauty supply store. Every two weeks she receives a supply of shampoo. Every four weeks she receives a carton of nail polishes. Every eight weeks she receives a box of combs, and every twelve weeks she receives a box of hair dyes. If Anita received a shipment of all these supplies today, when is the next time all four supplies will arrive on the same day?

F. in 12 weeks **H.** in 32 weeks
G. in 24 weeks **J.** in 48 weeks

181. Order $\frac{1}{4}$, $\frac{2}{7}$, and $\frac{5}{6}$ from least to greatest.

A. $\frac{2}{7}, \frac{5}{6}, \frac{1}{4}$ **C.** $\frac{1}{4}, \frac{2}{7}, \frac{5}{6}$
B. $\frac{5}{6}, \frac{2}{7}, \frac{1}{4}$ **D.** $\frac{1}{4}, \frac{5}{6}, \frac{2}{7}$

Order from least to greatest.

182. $-0.9, 0.45, \frac{1}{3}, \frac{1}{9}$

F. $\frac{1}{9}, \frac{1}{3}, -0.9, 0.45$ **H.** $-0.9, \frac{1}{9}, \frac{1}{3}, 0.45$
G. $-0.9, 0.45, \frac{1}{3}, \frac{1}{9}$ **J.** $-0.9, 0.45, \frac{1}{9}, \frac{1}{3}$

Find the sum or difference. Simplify if possible.

183. $\frac{4}{12} + \frac{9}{12}$

A. $\frac{1}{4}$ **B.** $\frac{13}{144}$ **C.** $\frac{13}{24}$ **D.** $1\frac{1}{12}$

184. $\frac{11}{w} - \frac{5}{w}$

F. $\frac{6}{w}$ **G.** $\frac{16}{w^2}$ **H.** $\frac{8}{w}$ **J.** $\frac{16}{w}$

185. You are cutting vegetables for a party. You have $\frac{1}{4}$ lb of carrots, $\frac{1}{4}$ lb of broccoli, and $\frac{3}{4}$ lb of peppers. How many pounds of vegetables do you have in all?

A. $1\frac{1}{4}$ lb **B.** 5 lb **C.** $2\frac{1}{2}$ lb **D.** $1\frac{3}{4}$ lb

186. The chart shows the weight of a puppy. How much weight did the puppy gain between Week 1 and Week 4?

Week 1	Week 2	Week 3	Week 4
$2\frac{3}{8}$ lb	$2\frac{6}{8}$ lb	3 lb	$3\frac{2}{8}$ lb

F. $\frac{5}{8}$ lb **G.** $\frac{7}{8}$ lb **H.** $1\frac{7}{8}$ lb **J.** $11\frac{3}{8}$ lb

187. A garden is $14\frac{1}{2}$ ft by $13\frac{1}{4}$ ft. What is the area of the garden?

A. $27\frac{1}{8}$ ft^2 **B.** $384\frac{1}{4}$ ft^2 **C.** $182\frac{1}{8}$ ft^2 **D.** $192\frac{1}{8}$ ft^2

188. A set of encyclopedias has 27 volumes. Each volume is $1\frac{3}{8}$ inches thick. If the volumes are placed side by side, how long will the set be?

F. $27\frac{3}{8}$ inches **G.** $37\frac{1}{8}$ inches **H.** $39\frac{1}{8}$ inches **J.** $47\frac{3}{8}$ inches

189. Sue needs $1\frac{1}{4}$ cups of flour for a batch of cookies. How many batches can she make with 9 cups of flour?

A. 6 batches **B.** 7 batches **C.** 4 batches **D.** 8 batches

Numeric Response

190. Find the value of the expression $7.6 + 4\frac{2}{5}$.

191. The maximum speed of a greyhound is 153 miles per hour less than 3 times the maximum speed of a cheetah. If a greyhound's maximum speed is 42 miles per hour, what is the maximum speed of a greyhound? Check to make sure your answer is reasonable.

192. A volleyball team scored 14 more points in its first game than in its third game. In the second game, the team scored 28 points. The total number of points scored was less than 80. What is the greatest number of points the team could have scored in its first game?

193. The formula for the volume, V, of a cylinder is $V = \pi r^2 h$, where r is the radius of the base of the cylinder and h is its height. Find the volume of a cylinder with a height of 4 centimeters and a radius of 2 centimeters. Use 3.14 for π.

194. Mai and Juan bike up a hill. Each has a different pace. The run for Mai's pace is 28 inches, and the rise is 7 inches. The run for Juan's pace is 16 inches. What is the rise of Juan's pace? If necessary, round your answer to the nearest tenth of an inch.

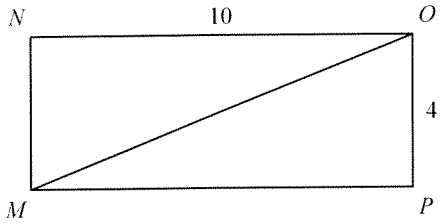
195. What value of n in the equation $nx + 7 = 4y$ would give a line with slope 2?

196. Joshua has made 50% of the lay-up baskets he has attempted at basketball practice. What is the probability that he will make the next three lay-up baskets he attempts? Express your answer as a decimal.

197. Technetium-99 has a half life of approximately 6 hours. The original measurement for the mass of a sample was lost. After 24 hours, 20 grams of Technetium-99 remain. How many grams was the original sample?

198. At the grocery store, the numbers of rolls of paper towels Joyce can buy is inversely proportional to the price of the rolls. She can afford 8 rolls of paper towels that cost \$0.50 each. How many rolls can Joyce buy if each costs \$2.00?

199. By the Pythagorean Theorem, the length d of a diagonal of a rectangle is given by $d = \sqrt{l^2 + w^2}$. Find the length of diagonal $\overline{MO}$ to the nearest tenth.



200. A 5-foot-tall student casts a shadow 7 feet long. At the same time, a flagpole casts a shadow that is 35 feet long. How many feet tall is the flagpole?

201. Manny works 40 hours per week. He must work for his parents where he earns \$8 per hour. He also works for a computer company where he earns \$20 per hour. What is the minimum number of hours Manny can work for the computer company to earn a total of \$464 per week from both jobs?

202. Find the determinant of the matrix $\begin{bmatrix} 3 & -2 \\ 8 & 5 \end{bmatrix}$.

203. What is the x-coordinate of the vertex of the graph of $f(x) = -7(x-9)^2 + 3$?

204. Find the positive root of $x^2 + 2x - 35 = 0$.

205. Evaluate $D(x) = 4x^{10} + 6x^8 - 8x^7 - 2x^5 - 2x^4 - 7x^2 + 5$ for $x = -1$.

206. Identify the value of k that makes $x = -5$ a solution to $x^3 + 3x^2 - x + k = 0$.

207. Evaluate $\log_4 4096$.

208. What is the distance between the foci of the hyperbola with equation $\frac{x^2}{54} - \frac{y^2}{27} = 1$?

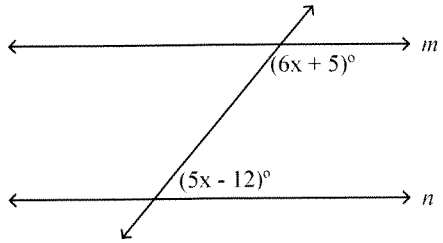
209. For any three events, A, B, and C,
$P(A \text{ or } B \text{ or } C) = P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C) + P(A \cap B \cap C)$. Use the table to find $P(A \cup C)$.

Event	$P(A)$	$P(B)$	$P(C)$	$P(A \cap B)$	$P(A \cap C)$	$P(B \cap C)$	$P(A \cap B \cap C)$
Probability	0.2	0.5	0.2	0.1	0.1	0.5	0.8

210. Armando lives on one end of a street with a newsstand on the other. Armando picks up newspapers at the newsstand and then delivers them to 14 equally-spaced houses on his way back. He travels from the newsstand to the first house, then delivers a newspaper to each house. At the end of his route, he continues down the street and goes home. Find the distance from the last house to Armando's home.

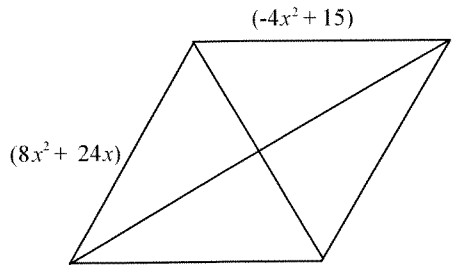
Event	**Distance from Newsstand to Armando's Home**	**Distance from Newsstand to First House**	**Distance Between Houses**	**Distance from Last House to Armando's Home**
Armando's newspaper delivery route	340 m	30 m	20 m	?

211. Find the value of x so that $m \parallel n$.



212. An isosceles triangle has a perimeter of 50 in. The congruent sides measure $(2x + 3)$ cm. The length of the third side is $4x$ cm. What is the value of x?

213. Find the value of x in the rhombus.



214. If 4, 6, and 10 and 14, 21, and x are the lengths of the corresponding sides of two similar triangles, what is the value of x?

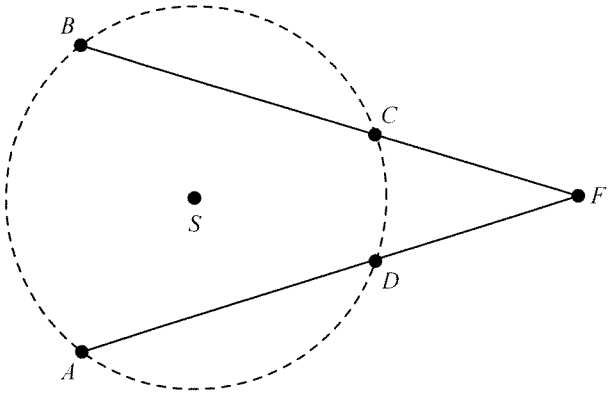
215. $\overline{PQ}$ with endpoints $P(3,2)$ and $Q(12,14)$ is dilated by a scale factor of 7. Find the length of $\overline{P'Q'}$.

216. $\overrightarrow{TM}$ has an initial point of $(-5, 5)$ and a terminal point of $(-7, -3)$. Find the magnitude of $\overrightarrow{TM}$ to the nearest tenth.

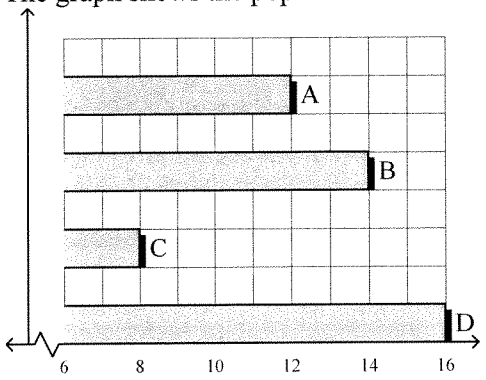
217. Find the surface area in square inches of a cylinder with a radius of 7 inches and a height of 4 inches. Use 3.14 for π. Round to the nearest tenth.

218. $\odot J$ has center $J(4, -3)$ and radius 5. What is the measure, in degrees, of the arc with endpoints $A(9, -3)$ and $B(4, 2)$?

219. In $\odot S$, the measure of arc AB is 129° and $m\angle CFD = 36°$. Find the degree measure of arc CD.

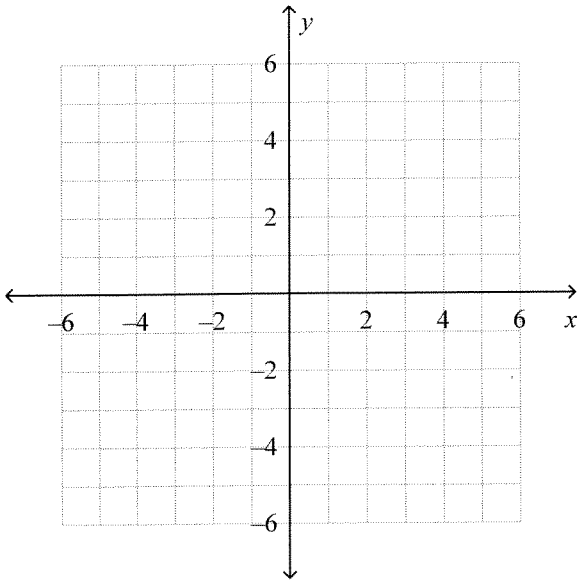


220. The graph shows the population of four towns.

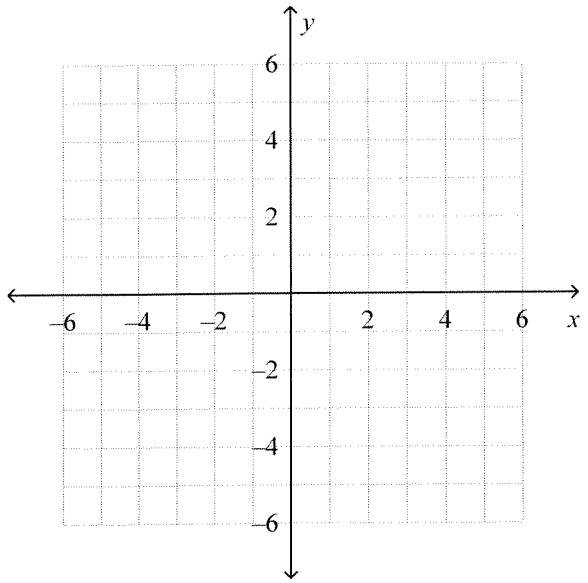


a. Which town *appears* to have about twice the population of Town C?
b. Which town *actually* has twice the population of Town C?
c. Explain why the graph is misleading.

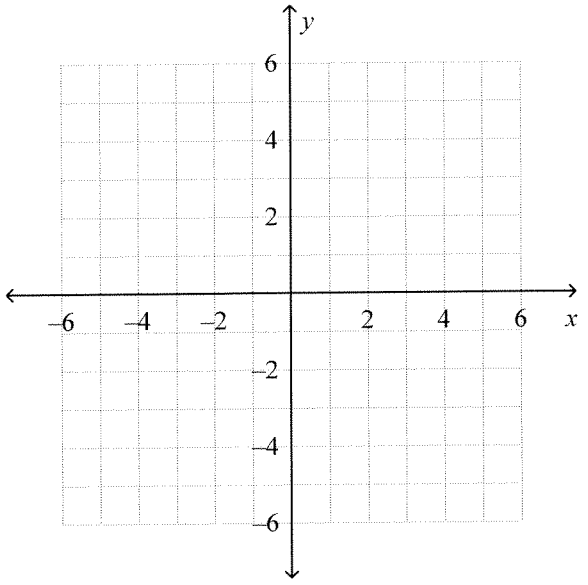
221. The vertices of a triangle are $A(-0.5, 2)$, $B(1, -2)$, and $C(-2, -2)$. Graph the triangle and its image after a translation of 1 units right, 1 units up.



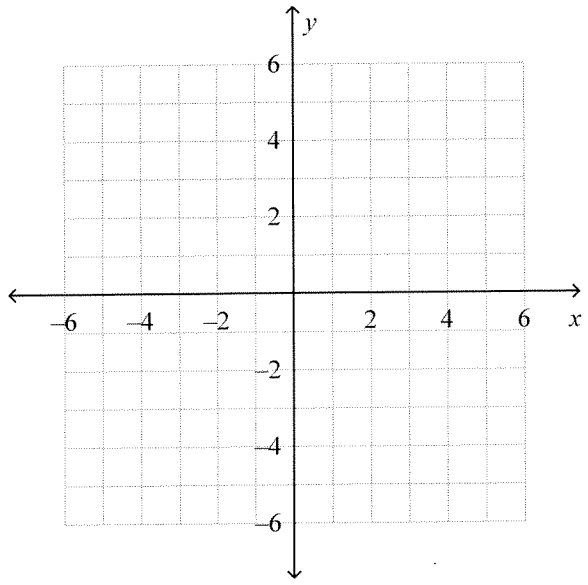
222. The vertices of a parallelogram are $A(0.75, 2)$, $B(3, 2)$, $C(2.25, -2)$, and $D(0, -2)$. Graph the parallelogram and its image after a translation of 2 units left, 1 units down.



223. Graph the point $M(2, 3)$ and its image after a reflection over $y = 4$.

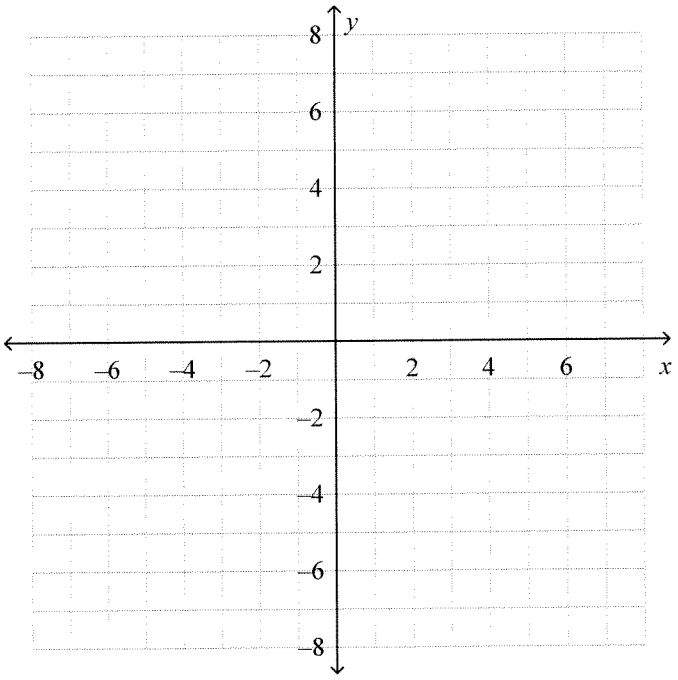


224. Graph the point $R(-4, -5)$. Then rotate it 180° degrees counterclockwise about the origin and graph the new point.

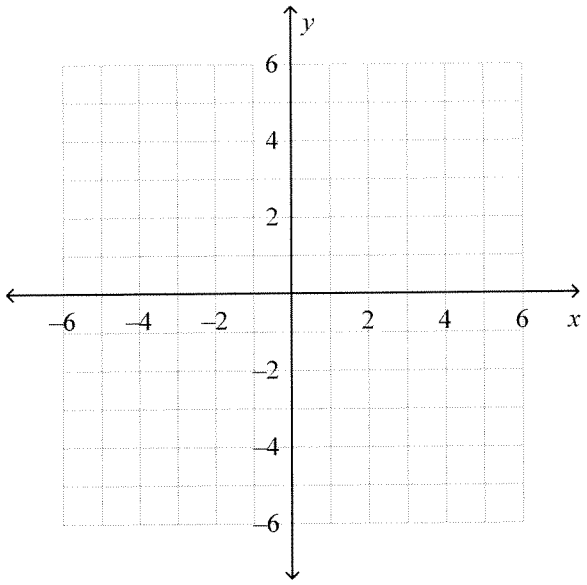


The vertices of a triangle are given. Graph both the figure and its image after a reflection over the specified line.

225. $C(-4, 2)$, $D(-5, -2)$, $E(-2, 1)$; $x = 0$



226. The vertices of a triangle are $E(1, 0)$, $F(5, -1)$, and $G(4, -4)$. Graph the triangle and its image after a rotation of 90° about the origin.



227. For $D = \begin{bmatrix} 0 & -2 & 5 \\ -1 & -2 & 6 \\ 0 & 0 & 3 \end{bmatrix}$ and $E = \begin{bmatrix} 6 & 2 & -5 \\ 0 & 1 & -2 \\ 2 & 1 & 2 \end{bmatrix}$, find $D - E$.

228. Graph $3y + 9 \geq 18$, using the set of integers as the replacement set.

229. The function $V = \frac{2}{3}\pi r^3$ gives the volume V of a hemisphere with radius r.

a. Graph the function for values from $r = 0$ to $r = 3$.

b. Use the graph to estimate the radius of a hemisphere with volume 10 in.^{3}.

230. Graph $y = x^3$ and $y = -\frac{1}{5}x^3$. Describe the similarities and differences of the two graphs.

231. Amy has a garden covering 900 square feet.

a. If she wants to plant moss roses on 10% of the garden, how many square feet will moss roses cover? Write and solve a percent equation to solve this problem.

b. If the garden occupies 25% of Amy's yard, what is the area of her yard in square feet? Write and solve a percent equation to solve this problem.

232. Ginnie bought a table cloth for $23.25. She embroidered a design on the table cloth and then sold it for $41.75.

a. What was the percent of increase in price of the tablecloth?

b. Suppose Ginnie wanted to make a profit of $24.50 on the sale of the tablecloth. What would be the percent of increase in the price for that amount of profit?

233. Danielle manages a clothing store. For a special promotion, she receives a shipment of coats that cost her $85 each.

a. Usually, the percent of markup for her store is 70%. Find the usual selling price of one of the coats.

b. The owner of the store suggests that she mark each coat with a price tag of $127.5. What is the percent of markup for each coat?

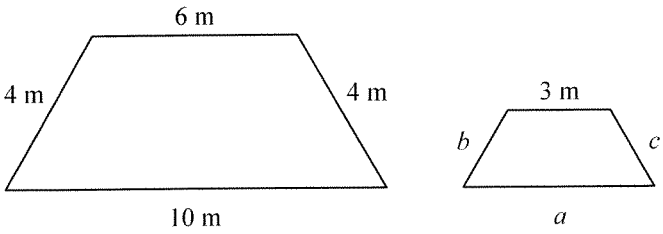
234. Suppose the cost of an item is c. First, the cost is discounted by 30%. Then sales tax of 6.5% is added to the sales price. Write an algebraic expression for the final cost of the item using the variable c.

235. An engineer is drawing plans for a new water tower. The tower is 82 feet tall and the tank is circular with a diameter of 26 feet.

a. The engineer builds a model of the tower with a scale of 1 inch : 5 feet. What are the dimensions of the model?

b. Suppose the engineer decides to build a second model such that the height of model is 20 inches. What is the scale for the model?

236. Dane designed two gardens for a museum. The gardens are shaped as similar trapezoids as shown. Find the perimeter of the smaller garden. Show your work.



237. Susan drove to visit her cousin, driving a distance of 646 miles. The trip took 16 hours of driving time.
a. What was her average speed for the hours that she drove?
b. Susan wants to shorten her driving time by one half hour. What average speed should she drive to do this? Write and solve a proportion to find Susan's new speed.

238. Allen makes a 3.4% commission selling vehicles at a car dealership.
a. How much commission does he make on the sale of a $17,000 car? Show your work.
b. During one busy month, Allen's total commission was $9,860. If a salesperson sells more than $200,000 in one month, the person receives a bonus. Did Allen receive a bonus? Explain.

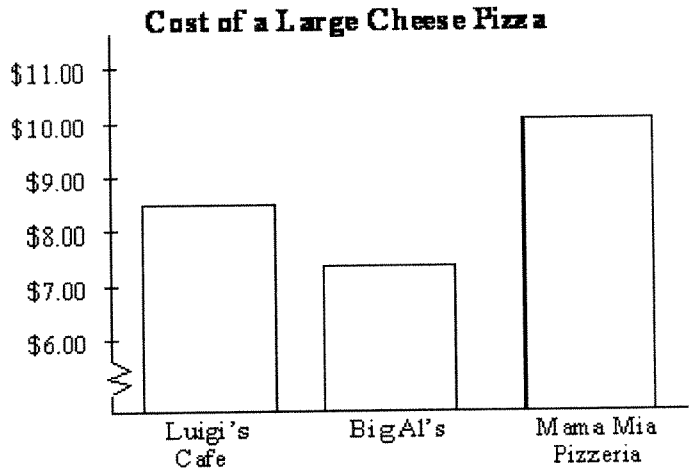
Other

239. Use this set of numbers: 39, 23.2, 18, 36.9, 45, 52. Add one more number to the data so that the range is 40. Explain how you found the number.

240. Ms. Brodie drew two box-and-whisker plots to represent her students' scores on the mid-year test and the final exam. What do the plots tell you about the progress of Ms. Brodie's class?

Name: _____ ID: A

241. The graph shows the cost of a large cheese pizza at three different restaurants. Explain how the size of the bars in the graph gives a false impression about the cost of a pizza at different restaurants.

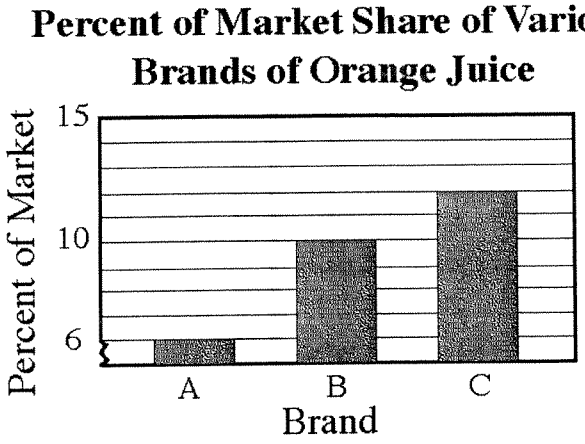


242. What impression does the graph below give you about home sales in Johnston? Is it misleading? Explain.

243. Arlene was given four pictures and asked to present four different combinations of all four pictures. Is this possible? Explain.

244. You want to find out how popular football is at your school. Design a survey plan that describes a good sample. Explain.

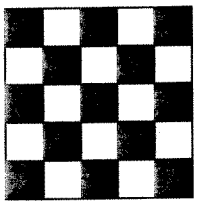
245.



The graph above shows the percent of market share for various brands of orange juice.
a. Why is this graph misleading?
b. Explain how to redraw the graph so it is not misleading.

246. How many combinations of nickels, dimes, and quarters add up to \$0.75 if you have at least one of each coin, and the number of nickels is greater than the number of quarters?

247. How many black squares would there be if you extended the pattern below to a size of 7 by 7 squares?



248. In Mr. Hansen's science class, 11 out of 29 students are going on the weekend field trip. In Ms. Chapman's science class, 23 out of 33 students are going on the trip. Is the ratio of students attending the field trip in Mr. Hansen's class the same as the ratio of students attending in Ms. Chapman's class? Explain your method for finding the answer.

249. A carpenter has a bolt with diameter $\frac{5}{16}$ in. Will the bolt fit in a hole made by a drill bit with diameter 0.3 in.? Explain.

250. Mary thinks that a quarter-pound hamburger is heavier than a 5-oz hamburger. Explain why she is incorrect.