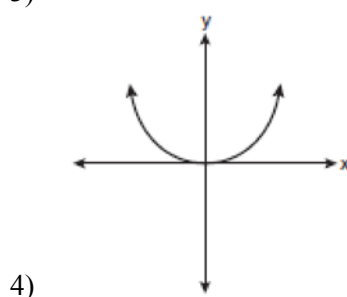
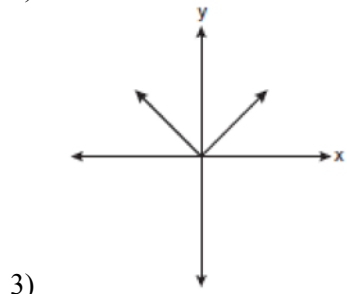
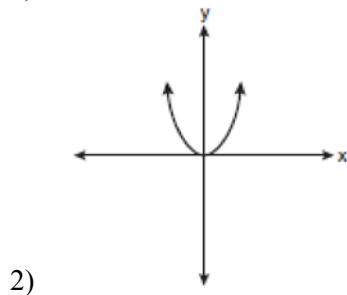
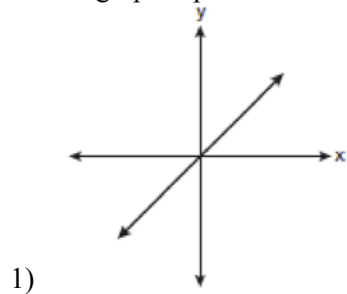
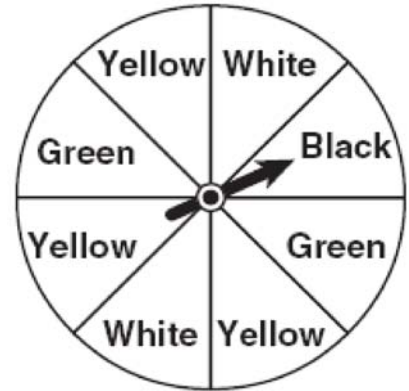


**0608ia**

1 Which graph represents a linear function?



2 A spinner is divided into eight equal regions as shown in the diagram below.



Which event is most likely to occur in one spin?

- 1) The arrow will land in a green or white area.
- 2) The arrow will land in a green or black area.
- 3) The arrow will land in a yellow or black area.
- 4) The arrow will land in a yellow or green area.

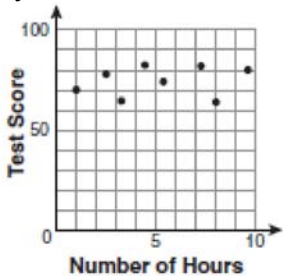
3 A school wants to add a coed soccer program. To determine student interest in the program, a survey will be taken. In order to get an unbiased sample, which group should the school survey?

- 1) every third student entering the building
- 2) every member of the varsity football team
- 3) every member in Ms. Zimmer's drama classes
- 4) every student having a second-period French class

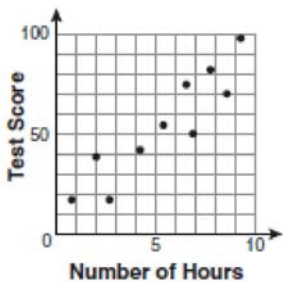
4 Factored, the expression  $16x^2 - 25y^2$  is equivalent to

- 1)  $(4x - 5y)(4x + 5y)$
- 2)  $(4x - 5y)(4x - 5y)$
- 3)  $(8x - 5y)(8x + 5y)$
- 4)  $(8x - 5y)(8x - 5y)$

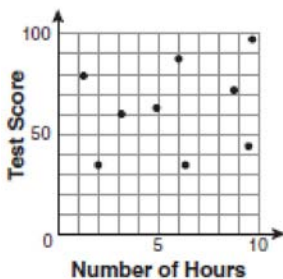
- 5 There is a negative correlation between the number of hours a student watches television and his or her social studies test score. Which scatter plot below displays this correlation?



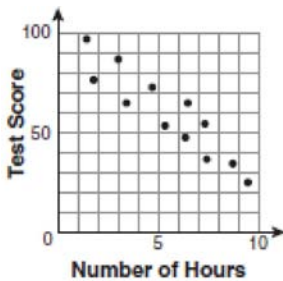
1)



2)



3)



4)

- 6 Jack bought 3 slices of cheese pizza and 4 slices of mushroom pizza for a total cost of \$12.50. Grace bought 3 slices of cheese pizza and 2 slices of mushroom pizza for a total cost of \$8.50. What is the cost of one slice of mushroom pizza?

- 1) \$1.50
- 2) \$2.00
- 3) \$3.00
- 4) \$3.50

- 7 What is the product of  $-3x^2y$  and  $(5xy^2 + xy)$ ?

- 1)  $-15x^3y^3 - 3x^3y^2$
- 2)  $-15x^3y^3 - 3x^3y$
- 3)  $-15x^2y^2 - 3x^2y$
- 4)  $-15x^3y^3 + xy$

- 8 The bowling team at Lincoln High School must choose a president, vice president, and secretary. If the team has 10 members, which expression could be used to determine the number of ways the officers could be chosen?

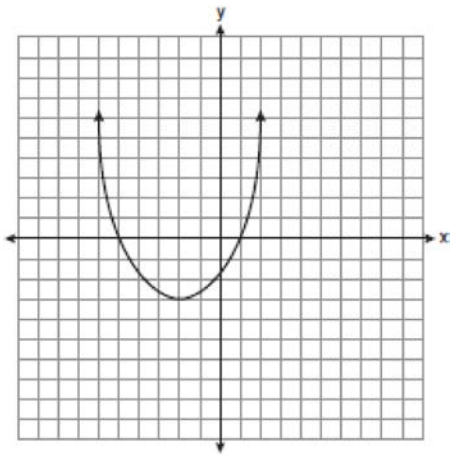
- 1)  ${}_3P_{10}$
- 2)  ${}_7P_3$
- 3)  ${}_{10}P_3$
- 4)  ${}_{10}P_7$

- 9 Lenny made a cube in technology class. Each edge measured 1.5 cm. What is the volume of the cube in cubic centimeters?

- 1) 2.25
- 2) 3.375
- 3) 9.0
- 4) 13.5

- 10 Which ordered pair is a solution to the system of equations  $y = x$  and  $y = x^2 - 2$ ?
- 1)  $(-2, -2)$
  - 2)  $(-1, 1)$
  - 3)  $(0, 0)$
  - 4)  $(2, 2)$

- 11 What are the vertex and the axis of symmetry of the parabola shown in the diagram below?



- 1) The vertex is  $(-2, -3)$ , and the axis of symmetry is  $x = -2$ .
- 2) The vertex is  $(-2, -3)$ , and the axis of symmetry is  $y = -2$ .
- 3) The vertex is  $(-3, -2)$ , and the axis of symmetry is  $y = -2$ .
- 4) The vertex is  $(-3, -2)$ , and the axis of symmetry is  $x = -2$ .

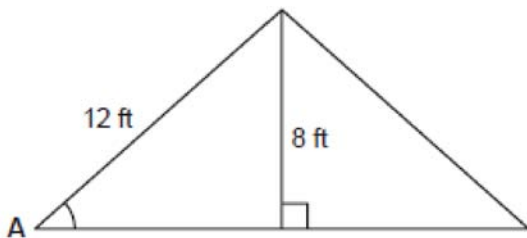
- 12 Pam is playing with red and black marbles. The number of red marbles she has is three more than twice the number of black marbles she has. She has 42 marbles in all. How many red marbles does Pam have?
- 1) 13
  - 2) 15
  - 3) 29
  - 4) 33

- 13 What is half of  $2^6$ ?
- 1)  $1^3$
  - 2)  $1^6$
  - 3)  $2^3$
  - 4)  $2^5$

- 14 Which equation represents a line that is parallel to the line  $y = -4x + 5$ ?
- 1)  $y = -4x + 3$
  - 2)  $y = -\frac{1}{4}x + 5$
  - 3)  $y = \frac{1}{4}x + 3$
  - 4)  $y = 4x + 5$

- 15 What is the product of  $\frac{x^2 - 1}{x + 1}$  and  $\frac{x + 3}{3x - 3}$  expressed in simplest form?
- 1)  $x$
  - 2)  $\frac{x}{3}$
  - 3)  $x + 3$
  - 4)  $\frac{x + 3}{3}$

- 16 The center pole of a tent is 8 feet long, and a side of the tent is 12 feet long as shown in the diagram below.



If a right angle is formed where the center pole meets the ground, what is the measure of angle  $A$  to the nearest degree?

- 1) 34
  - 2) 42
  - 3) 48
  - 4) 56
- 17 Which value of  $x$  makes the expression  $\frac{x+4}{x-3}$  undefined?

- 1) -4
- 2) -3
- 3) 3
- 4) 0

- 18 Consider the set of integers greater than -2 and less than 6. A subset of this set is the positive factors of 5. What is the complement of this subset?

- 1)  $\{0, 2, 3, 4\}$
- 2)  $\{-1, 0, 2, 3, 4\}$
- 3)  $\{-2, -1, 0, 2, 3, 4, 6\}$
- 4)  $\{-2, -1, 0, 1, 2, 3, 4, 5, 6\}$

- 19 Which data set describes a situation that could be classified as qualitative?
- 1) the elevations of the five highest mountains in the world
  - 2) the ages of presidents at the time of their inauguration
  - 3) the opinions of students regarding school lunches
  - 4) the shoe sizes of players on the basketball team

- 20 What is the slope of the line that passes through the points  $(-6, 1)$  and  $(4, -4)$ ?

- 1) -2
- 2) 2
- 3)  $-\frac{1}{2}$
- 4)  $\frac{1}{2}$

- 21 Students in a ninth grade class measured their heights,  $h$ , in centimeters. The height of the shortest student was 155 cm, and the height of the tallest student was 190 cm. Which inequality represents the range of heights?

- 1)  $155 < h < 190$
- 2)  $155 \leq h \leq 190$
- 3)  $h \geq 155$  or  $h \leq 190$
- 4)  $h > 155$  or  $h < 190$

- 22 The table below shows a cumulative frequency distribution of runners' ages.

**Cumulative Frequency Distribution of Runners' Ages**

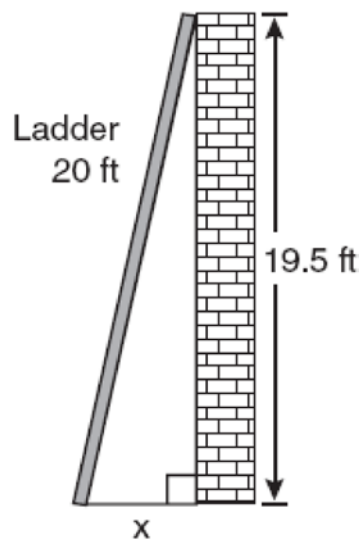
Age Group	Total
20–29	8
20–39	18
20–49	25
20–59	31
20–69	35

According to the table, how many runners are in their forties?

- 1) 25
  - 2) 10
  - 3) 7
  - 4) 6
- 23 Mr. Turner bought  $x$  boxes of pencils. Each box holds 25 pencils. He left 3 boxes of pencils at home and took the rest to school. Which expression represents the total number of pencils he took to school?
- 1)  $22x$
  - 2)  $25x - 3$
  - 3)  $25 - 3x$
  - 4)  $25x - 75$

- 24 Which expression represents  $\frac{2x^2 - 12x}{x - 6}$  in simplest form?
- 1) 0
  - 2)  $2x$
  - 3)  $4x$
  - 4)  $2x + 2$

- 25 Don placed a ladder against the side of his house as shown in the diagram below.



Which equation could be used to find the distance,  $x$ , from the foot of the ladder to the base of the house?

- 1)  $x = 20 - 19.5$
- 2)  $x = 20^2 - 19.5^2$
- 3)  $x = \sqrt{20^2 - 19.5^2}$
- 4)  $x = \sqrt{20^2 + 19.5^2}$

26 Which value of  $x$  is a solution of  $\frac{5}{x} = \frac{x+13}{6}$ ?

- 1)  $-2$
- 2)  $-3$
- 3)  $-10$
- 4)  $-15$

27 Mrs. Ayer is painting the outside of her son's toy box, including the top and bottom. The toy box measures 3 feet long, 1.5 feet wide, and 2 feet high. What is the total surface area she will paint?

- 1)  $9.0 \text{ ft}^2$
- 2)  $13.5 \text{ ft}^2$
- 3)  $22.5 \text{ ft}^2$
- 4)  $27.0 \text{ ft}^2$

28 What is  $\frac{\sqrt{32}}{4}$  expressed in simplest radical form?

- 1)  $\sqrt{2}$
- 2)  $4\sqrt{2}$
- 3)  $\sqrt{8}$
- 4)  $\frac{\sqrt{8}}{2}$

29 Consider the graph of the equation  $y = ax^2 + bx + c$ , when  $a \neq 0$ . If  $a$  is multiplied by 3, what is true of the graph of the resulting parabola?

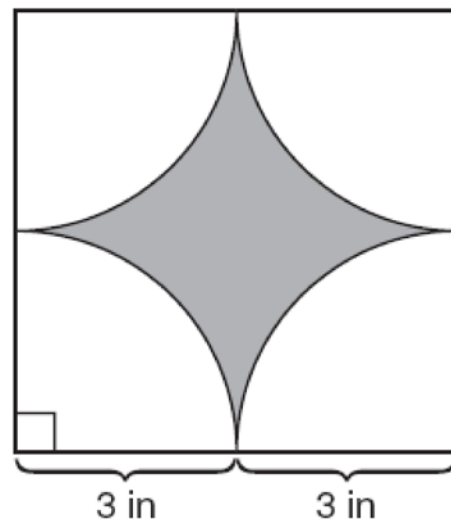
- 1) The vertex is 3 units above the vertex of the original parabola.
- 2) The new parabola is 3 units to the right of the original parabola.
- 3) The new parabola is wider than the original parabola.
- 4) The new parabola is narrower than the original parabola.

30 Kathy plans to purchase a car that depreciates (loses value) at a rate of 14% per year. The initial cost of the car is \$21,000. Which equation represents the value,  $v$ , of the car after 3 years?

- 1)  $v = 21,000(0.14)^3$
- 2)  $v = 21,000(0.86)^3$
- 3)  $v = 21,000(1.14)^3$
- 4)  $v = 21,000(0.86)(3)$

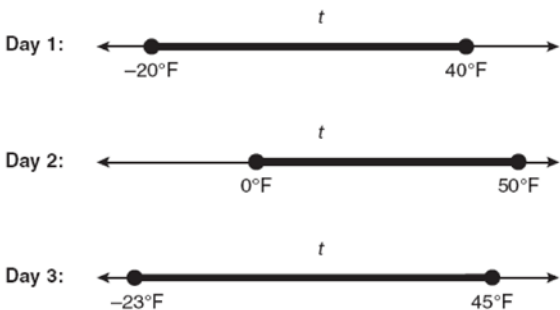
31 Tom drove 290 miles from his college to home and used 23.2 gallons of gasoline. His sister, Ann, drove 225 miles from her college to home and used 15 gallons of gasoline. Whose vehicle had better gas mileage? Justify your answer.

32 A designer created the logo shown below. The logo consists of a square and four quarter-circles of equal size.



Express, in terms of  $\pi$ , the exact area, in square inches, of the shaded region.

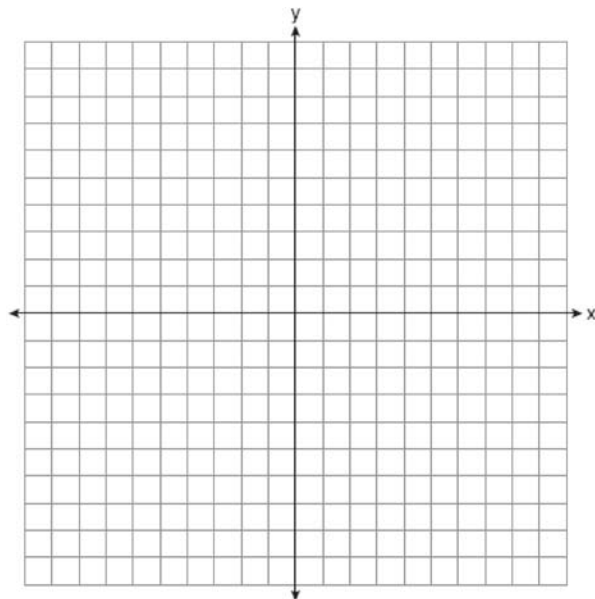
- 33 Maureen tracks the range of outdoor temperatures over three days. She records the following information.



Express the intersection of the three sets as an inequality in terms of temperature,  $t$ .

- 34 Peter begins his kindergarten year able to spell 10 words. He is going to learn to spell 2 new words every day. Write an inequality that can be used to determine how many days,  $d$ , it takes Peter to be able to spell *at least* 75 words. Use this inequality to determine the minimum number of whole days it will take for him to be able to spell *at least* 75 words.
- 35 The Hudson Record Store is having a going-out-of-business sale. CDs normally sell for \$18.00. During the first week of the sale, all CDs will sell for \$15.00. Written as a fraction, what is the rate of discount? What is this rate expressed as a percent? Round your answer to the *nearest hundredth of a percent*. During the second week of the sale, the same CDs will be on sale for 25% off the *original* price. What is the price of a CD during the second week of the sale?

- 36 Graph the equation  $y = x^2 - 2x - 3$  on the accompanying set of axes. Using the graph, determine the roots of the equation  $x^2 - 2x - 3 = 0$ .



- 37 A contractor needs 54 square feet of brick to construct a rectangular walkway. The length of the walkway is 15 feet more than the width. Write an equation that could be used to determine the dimensions of the walkway. Solve this equation to find the length and width, in feet, of the walkway.

- 38 Sophie measured a piece of paper to be 21.7 cm by 28.5 cm. The piece of paper is actually 21.6 cm by 28.4 cm. Determine the number of square centimeters in the area of the piece of paper using Sophie's measurements. Determine the number of square centimeters in the actual area of the piece of paper. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*. Sophie does not think there is a significant amount of error. Do you agree or disagree? Justify your answer.
- 39 The prices of seven race cars sold last week are listed in the table below.

Price per Race Car	Number of Race Cars
\$126,000	1
\$140,000	2
\$180,000	1
\$400,000	2
\$819,000	1

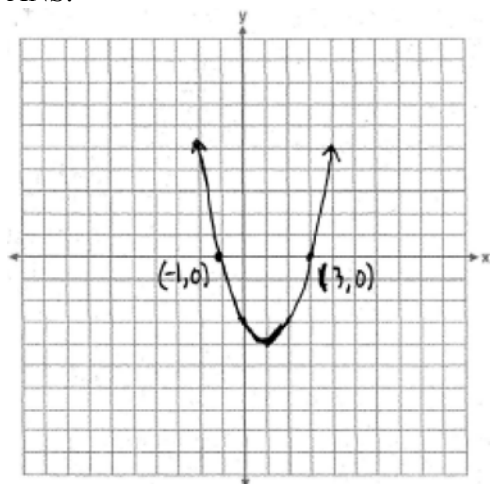
What is the mean value of these race cars, in dollars? What is the median value of these race cars, in dollars? State which of these measures of central tendency best represents the value of the seven race cars. Justify your answer.

**0608ia****Answer Section**

1	ANS: 1 TOP: Families of Functions	PTS: 2	REF: 060801ia	STA: A.G.4
2	ANS: 4 TOP: Theoretical Probability	PTS: 2	REF: 060802ia	STA: A.S.22
3	ANS: 1 TOP: Analysis of Data	PTS: 2	REF: 060803ia	STA: A.S.3
4	ANS: 1 TOP: Factoring the Difference of Perfect Squares	PTS: 2	REF: 060804ia	STA: A.A.19
5	ANS: 4 TOP: Scatter Plots	PTS: 2	REF: 060805ia	STA: A.S.12
6	ANS: 2 TOP: Writing Linear Systems	PTS: 2	REF: 060806ia	STA: A.A.7
7	ANS: 1 TOP: Multiplication of Powers	PTS: 2	REF: 060807ia	STA: A.A.13
8	ANS: 3 TOP: Permutations	PTS: 2	REF: 060808ia	STA: A.N.8
9	ANS: 2 TOP: Volume	PTS: 2	REF: 060809ia	STA: A.G.2
10	ANS: 4 TOP: Quadratic-Linear Systems	PTS: 2	REF: 060810ia	STA: A.A.11
11	ANS: 1 TOP: Identifying the Vertex of a Quadratic Given Graph	PTS: 2	REF: 060811ia	STA: A.G.10
12	ANS: 3 TOP: Writing Linear Systems	PTS: 2	REF: 060812ia	STA: A.A.7
13	ANS: 4 TOP: Division of Powers	PTS: 2	REF: 060813ia	STA: A.A.12
14	ANS: 1 TOP: Parallel and Perpendicular Lines	PTS: 2	REF: 060814ia	STA: A.A.38
15	ANS: 4 TOP: Multiplication and Division of Rationals	PTS: 2	REF: 060815ia	STA: A.A.18
16	ANS: 2 TOP: Using Trigonometry to Find an Angle	PTS: 2	REF: 060816ia	STA: A.A.43
17	ANS: 3 TOP: Undefined Rationals	PTS: 2	REF: 060817ia	STA: A.A.15
18	ANS: 2 TOP: Set Theory	PTS: 2	REF: 060818ia	STA: A.A.30
19	ANS: 3 TOP: Analysis of Data	PTS: 2	REF: 060819ia	STA: A.S.1
20	ANS: 3 TOP: Slope	PTS: 2	REF: 060820ia	STA: A.A.33
21	ANS: 2 TOP: Modeling Inequalities	PTS: 2	REF: 060821ia	STA: A.A.5
22	ANS: 3 TOP: Frequency Histograms, Bar Graphs and Tables	PTS: 2	REF: 060822ia	STA: A.S.9

- 23 ANS: 4                   PTS: 2                   REF: 060823ia           STA: A.A.1  
TOP: Expressions
- 24 ANS: 2                   PTS: 2                   REF: 060824ia           STA: A.A.14  
TOP: Rational Expressions
- 25 ANS: 3                   PTS: 2                   REF: 060825ia           STA: A.A.45  
TOP: Pythagoras
- 26 ANS: 4                   PTS: 2                   REF: 060826ia           STA: A.A.26  
TOP: Solving Rationals
- 27 ANS: 4                   PTS: 2                   REF: 060827ia           STA: A.G.2  
TOP: Surface Area
- 28 ANS: 1                   PTS: 2                   REF: 060828ia           STA: A.N.2  
TOP: Simplifying Radicals
- 29 ANS: 4                   PTS: 2                   REF: 060829ia           STA: A.G.5  
TOP: Graphing Quadratics
- 30 ANS: 2                   PTS: 2                   REF: 060830ia           STA: A.A.9  
TOP: Exponential Functions
- 31 ANS:  
Ann's
- PTS: 2                   REF: 060831ia           STA: A.M.1           TOP: Using Rate
- 32 ANS:  
 $36 - 9\pi$
- PTS: 2                   REF: 060832ia           STA: A.G.1           TOP: Compositions of Polygons and Circles
- 33 ANS:  
 $0 \leq t \leq 40$
- PTS: 2                   REF: 060833ia           STA: A.A.31           TOP: Set Theory
- 34 ANS:  
 $10 + 2d \geq 75, 33$
- PTS: 3                   REF: 060834ia           STA: A.A.6           TOP: Modeling Inequalities
- 35 ANS:  
 $\frac{1}{6}, 16.67\%, \$13.50$
- PTS: 3                   REF: 060835ia           STA: A.N.5           TOP: Percents

36 ANS:



PTS: 3

REF: 060836ia

STA: A.G.8

TOP: Solving Quadratics by Graphing

37 ANS:

$$w(w + 15) = 54, 3, 18$$

PTS: 4

REF: 060837ia

STA: A.A.8

TOP: Geometric Applications of Quadratics

38 ANS:

$$618.45, 613.44, 0.008$$

PTS: 4

REF: 060838ia

STA: A.M.3

TOP: Error

39 ANS:

$$315,000, 180,000, \text{median}$$

PTS: 4

REF: 060839ia

STA: A.S.4

TOP: Frequency Histograms, Bar Graphs and Tables