

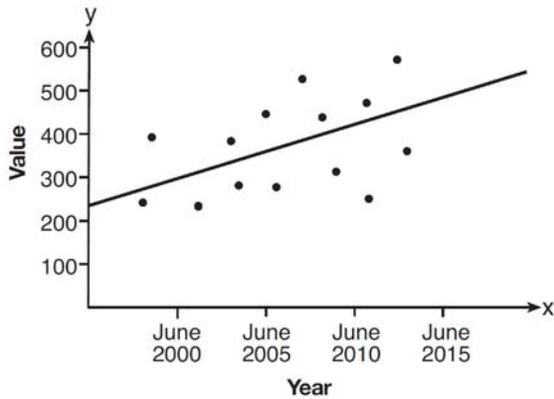
0613ia

- 1 Which expression represents “5 less than twice x ”?
- 1) $2x - 5$
 - 2) $5 - 2x$
 - 3) $2(5 - x)$
 - 4) $2(x - 5)$

- 2 Gabriella has 20 quarters, 15 dimes, 7 nickels, and 8 pennies in a jar. After taking 6 quarters out of the jar, what will be the probability of Gabriella randomly selecting a quarter from the coins left in the jar?

- 1) $\frac{14}{44}$
- 2) $\frac{30}{44}$
- 3) $\frac{14}{50}$
- 4) $\frac{20}{50}$

- 3 Based on the line of best fit drawn below, which value could be expected for the data in June 2015?



- 1) 230
- 2) 310
- 3) 480
- 4) 540

- 4 If the point $(5, k)$ lies on the line represented by the equation $2x + y = 9$, the value of k is

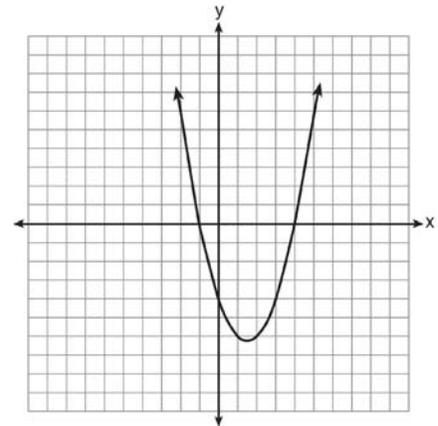
- 1) 1
- 2) 2
- 3) -1
- 4) -2

- 5 A soda container holds $5\frac{1}{2}$ gallons of soda. How many ounces of soda does this container hold?

1 quart = 32 ounces
1 gallon = 4 quarts

- 1) 44
- 2) 176
- 3) 640
- 4) 704

- 6 The roots of a quadratic equation can be found using the graph below.



What are the roots of this equation?

- 1) -4, only
- 2) -4 and -1
- 3) -1 and 4
- 4) -4, -1, and 4

- 7 If the area of a rectangle is represented by $x^2 + 8x + 15$ and its length is represented by $x + 5$, which expression represents the width of the rectangle?
- 1) $x + 3$
 - 2) $x - 3$
 - 3) $x^2 + 6x + 5$
 - 4) $x^2 + 7x + 10$

- 8 Which set of data describes a situation that could be classified as qualitative?
- 1) the colors of the birds at the city zoo
 - 2) the shoe size of the zookeepers at the city zoo
 - 3) the heights of the giraffes at the city zoo
 - 4) the weights of the monkeys at the city zoo

- 9 The value of the expression $6! + \frac{5!(3!)}{4!} - 10$ is
- 1) 50
 - 2) 102
 - 3) 740
 - 4) 750

- 10 Which interval notation represents $-3 \leq x \leq 3$?
- 1) $[-3, 3]$
 - 2) $(-3, 3]$
 - 3) $[-3, 3)$
 - 4) $(-3, 3)$

- 11 The solutions of $x^2 = 16x - 28$ are
- 1) -2 and -14
 - 2) 2 and 14
 - 3) -4 and -7
 - 4) 4 and 7

- 12 If the expression $(2y^a)^4$ is equivalent to $16y^8$, what is the value of a ?
- 1) 12
 - 2) 2
 - 3) 32
 - 4) 4

- 13 Which table shows bivariate data?

1)

Age (yr)	Frequency
14	12
15	21
16	14
17	19
18	15

2)

Type of Car	Average Gas Mileage (mpg)
van	25
SUV	23
luxury	26
compact	28
pickup	22

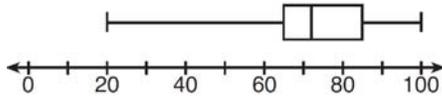
3)

Time Spent Studying (hr)	Test Grade (%)
1	65
2	72
3	83
4	85
5	92

4)

Day	Temperature (degrees F)
Monday	63
Tuesday	58
Wednesday	72
Thursday	74
Friday	78

- 14 The box-and-whisker plot below represents the results of tests scores in a math class.



What do the scores 65, 85, and 100 represent?

- 1) Q_1 , median, Q_3
 - 2) Q_1 , Q_3 , maximum
 - 3) median, Q_1 , maximum
 - 4) minimum, median, maximum
- 15 The expression $\frac{x-3}{x+2}$ is undefined when the value

- of x is
- 1) -2 , only
 - 2) -2 and 3
 - 3) 3 , only
 - 4) -3 and 2

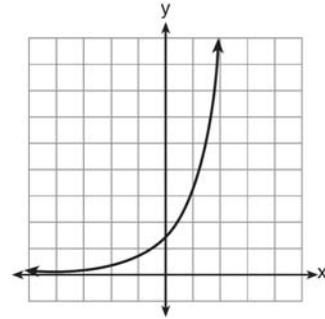
- 16 If $rx - st = r$, which expression represents x ?

- 1) $\frac{r+st}{r}$
- 2) $\frac{r}{r+st}$
- 3) $\frac{r}{r-st}$
- 4) $\frac{r-st}{r}$

- 17 What is the solution of the equation $\frac{x+2}{2} = \frac{4}{x}$?

- 1) 1 and -8
- 2) 2 and -4
- 3) -1 and 8
- 4) -2 and 4

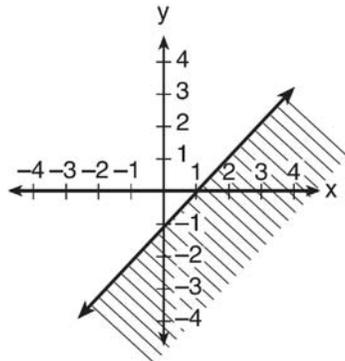
- 18 Which type of function is graphed below?



- 1) linear
 - 2) quadratic
 - 3) exponential
 - 4) absolute value
- 19 What is the slope of the line represented by the equation $4x + 3y = 12$?

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

- 20 The diagram below shows the graph of which inequality?



- 1) $y > x - 1$
 2) $y \geq x - 1$
 3) $y < x - 1$
 4) $y \leq x - 1$
- 21 Carol plans to sell twice as many magazine subscriptions as Jennifer. If Carol and Jennifer need to sell at least 90 subscriptions in all, which inequality could be used to determine how many subscriptions, x , Jennifer needs to sell?

- 1) $x \geq 45$
 2) $2x \geq 90$
 3) $2x - x \geq 90$
 4) $2x + x \geq 90$
- 22 When $2x^2 - 3x + 2$ is subtracted from $4x^2 - 5x + 2$, the result is

- 1) $2x^2 - 2x$
 2) $-2x^2 + 2x$
 3) $-2x^2 - 8x + 4$
 4) $2x^2 - 8x + 4$

- 23 Which expression represents the number of hours in w weeks and d days?

- 1) $7w + 12d$
 2) $84w + 24d$
 3) $168w + 24d$
 4) $168w + 60d$

- 24 Given: $R = \{1, 2, 3, 4\}$

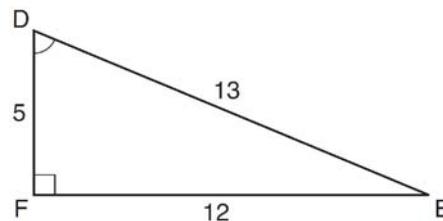
$A = \{0, 2, 4, 6\}$

$P = \{1, 3, 5, 7\}$

What is $R \cap P$?

- 1) $\{0, 1, 2, 3, 4, 5, 6, 7\}$
 2) $\{1, 2, 3, 4, 5, 7\}$
 3) $\{1, 3\}$
 4) $\{2, 4\}$

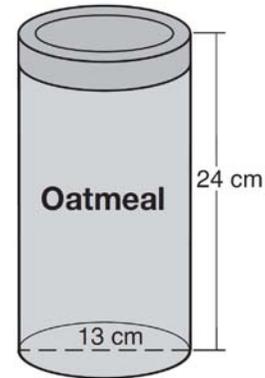
- 25 Which equation could be used to find the measure of angle D in the right triangle shown in the diagram below?



- 1) $\cos D = \frac{12}{13}$
 2) $\cos D = \frac{13}{12}$
 3) $\sin D = \frac{5}{13}$
 4) $\sin D = \frac{12}{13}$

- 26 If the roots of a quadratic equation are -2 and 3 , the equation can be written as
- 1) $(x - 2)(x + 3) = 0$
 - 2) $(x + 2)(x - 3) = 0$
 - 3) $(x + 2)(x + 3) = 0$
 - 4) $(x - 2)(x - 3) = 0$
- 27 Which equation represents a line that is parallel to the y -axis and passes through the point $(4, 3)$?
- 1) $x = 3$
 - 2) $x = 4$
 - 3) $y = 3$
 - 4) $y = 4$
- 28 There are 18 students in a class. Each day, the teacher randomly selects three students to assist in a game: a leader, a recorder, and a timekeeper. In how many possible ways can the jobs be assigned?
- 1) 306
 - 2) 816
 - 3) 4896
 - 4) 5832
- 29 In triangle RST , angle R is a right angle. If $TR = 6$ and $TS = 8$, what is the length of RS ?
- 1) 10
 - 2) 2
 - 3) $2\sqrt{7}$
 - 4) $7\sqrt{2}$
- 30 How many solutions are there for the following system of equations?
- $$y = x^2 - 5x + 3$$
- $$y = x - 6$$
- 1) 1
 - 2) 2
 - 3) 3
 - 4) 0

- 31 Solve the inequality $-5(x - 7) < 15$ algebraically for x .
- 32 Oatmeal is packaged in a cylindrical container, as shown in the diagram below.



The diameter of the container is 13 centimeters and its height is 24 centimeters. Determine, in terms of π , the volume of the cylinder, in cubic centimeters.

- 33 The distance from Earth to Mars is 136,000,000 miles. A spaceship travels at 31,000 miles per hour. Determine, to the *nearest day*, how long it will take the spaceship to reach Mars.

- 34 The menu for the high school cafeteria is shown below.

Main Course	Vegetable	Dessert	Beverage
veggie burger	corn	gelatin	milk
pizza	green beans	fruit salad	juice
tuna sandwich	carrots	yogurt	bottled water
frankfurter		cookie	
chicken tenders		ice cream cup	

Determine the number of possible meals consisting of a main course, a vegetable, a dessert, and a beverage that can be selected from the menu.

Determine how many of these meals will include chicken tenders. If a student chooses pizza, corn or carrots, a dessert, and a beverage from the menu, determine the number of possible meals that can be selected.

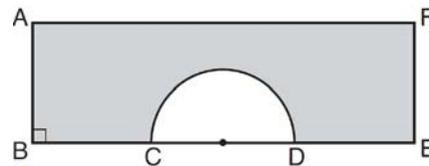
- 35 A man standing on level ground is 1000 feet away from the base of a 350-foot-tall building. Find, to the *nearest degree*, the measure of the angle of elevation to the top of the building from the point on the ground where the man is standing.

- 36 Express $\sqrt{25} - 2\sqrt{3} + \sqrt{27} + 2\sqrt{9}$ in simplest radical form.

- 37 Solve algebraically: $\frac{2}{3x} + \frac{4}{x} = \frac{7}{x+1}$
 [Only an algebraic solution can receive full credit.]

- 38 A jar contains five red marbles and three green marbles. A marble is drawn at random and not replaced. A second marble is then drawn from the jar. Find the probability that the first marble is red and the second marble is green. Find the probability that both marbles are red. Find the probability that both marbles are the same color.

- 39 In the diagram below of rectangle $AFEB$ and a semicircle with diameter \overline{CD} , $AB = 5$ inches, $AB = BC = DE = FE$, and $CD = 6$ inches. Find the area of the shaded region, to the *nearest hundredth of a square inch*.



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Answer Section

- 1 ANS: 1 PTS: 2 REF: 061301ia STA: A.A.1
TOP: Expressions
- 2 ANS: 1
$$\frac{20 - 6}{(20 - 6) + 15 + 7 + 8} = \frac{14}{44}$$
- PTS: 2 REF: 061302ia STA: A.S.18 TOP: Conditional Probability
- 3 ANS: 3 PTS: 2 REF: 061303ia STA: A.S.17
TOP: Scatter Plots
- 4 ANS: 3
 $2(5) + k = 9$
 $10 + k = 9$
 $k = -1$
- PTS: 2 REF: 061304ia STA: A.A.39 TOP: Identifying Points on a Line
- 5 ANS: 4
 $5.5 \text{ g} \times \frac{4 \text{ q}}{1 \text{ g}} \times \frac{32 \text{ oz}}{1 \text{ q}} = 704 \text{ oz}$
- PTS: 2 REF: 061305ia STA: A.M.2 TOP: Conversions
KEY: dimensional analysis
- 6 ANS: 3 PTS: 2 REF: 061306ia STA: A.G.8
TOP: Solving Quadratics by Graphing
- 7 ANS: 1
$$\frac{(x + 5)(x + 3)}{x + 5} = x + 3$$
- PTS: 2 REF: 0613071a STA: A.A.16 TOP: Rational Expressions
KEY: $a > 0$
- 8 ANS: 1
The other situations are quantitative.
- PTS: 2 REF: 061308ia STA: A.S.1 TOP: Analysis of Data
- 9 ANS: 3
 $6! + \frac{5!(3!)}{4!} - 10 = 720 + 5(6) - 10 = 740$
- PTS: 2 REF: 061309ia STA: A.N.6 TOP: Evaluating Expressions
- 10 ANS: 1 PTS: 2 REF: 061310ia STA: A.A.29
TOP: Set Theory

11 ANS: 2

$$x^2 - 16x + 28 = 0$$

$$(x - 14)(x - 2) = 0$$

$$x = 14, 2$$

PTS: 2 REF: 061311ia STA: A.A.27 TOP: Solving Quadratics by Factoring

12 ANS: 2 PTS: 2 REF: 061312ia STA: A.A.12

TOP: Powers of Powers

13 ANS: 3

Due to lack of specificity in the wording, this 13th question was removed from the June, 2013 Regents Exam.

PTS: 2 REF: 061313ia STA: A.S.2 TOP: Analysis of Data

14 ANS: 2 PTS: 2 REF: 061314ia STA: A.S.6

TOP: Box-and-Whisker Plots

15 ANS: 1 PTS: 2 REF: 061315ia STA: A.A.15

TOP: Undefined Rationals

16 ANS: 1

$$rx - st = r$$

$$rx = r + st$$

$$x = \frac{r + st}{r}$$

PTS: 2 REF: 061316ia STA: A.A.23 TOP: Transforming Formulas

17 ANS: 2

$$\frac{x + 2}{2} = \frac{4}{x}$$

$$x^2 + 2x = 8$$

$$x^2 + 2x - 8 = 0$$

$$(x + 4)(x - 2) = 0$$

$$x = -4, 2$$

PTS: 2 REF: 061317ia STA: A.A.26 TOP: Solving Rationals

18 ANS: 3 PTS: 2 REF: 061318ia STA: A.G.4

TOP: Families of Functions

19 ANS: 4

$$m = \frac{-A}{B} = \frac{-4}{3}$$

PTS: 2 REF: 061319ia STA: A.A.37 TOP: Slope

20 ANS: 4 PTS: 2 REF: 061320ia STA: A.G.6

TOP: Linear Inequalities

21 ANS: 4 PTS: 2 REF: 061321ia STA: A.A.5

TOP: Modeling Inequalities

- 22 ANS: 1 PTS: 2 REF: 061322ia STA: A.A.13
TOP: Addition and Subtraction of Polynomials KEY: subtraction
- 23 ANS: 3 PTS: 2 REF: 061323ia STA: A.A.1
TOP: Expressions
- 24 ANS: 3 PTS: 2 REF: 061324ia STA: A.A.31
TOP: Set Theory
- 25 ANS: 4
$$\sin D = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{12}{13}$$
- PTS: 2 REF: 061325ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle
- 26 ANS: 2 PTS: 2 REF: 061326ia STA: A.A.28
TOP: Roots of Quadratics
- 27 ANS: 2 PTS: 2 REF: 061327ia STA: A.A.36
TOP: Parallel and Perpendicular Lines
- 28 ANS: 3
 ${}_{18}P_3 = 4896$
- PTS: 2 REF: 061328ia STA: A.N.8 TOP: Permutations
- 29 ANS: 3
$$\sqrt{8^2 - 6^2} = \sqrt{28} = \sqrt{4} \sqrt{7} = 2\sqrt{7}$$
- PTS: 2 REF: 061329ia STA: A.A.45 TOP: Pythagorean Theorem
- 30 ANS: 1
 $x^2 - 5x + 3 = x - 6$ $y = 3 - 6 = -3$ (3, -3)
 $x^2 - 6x + 9 = 0$
 $(x - 3)^2 = 0$
 $x = 3$
- PTS: 2 REF: 061330ia STA: A.G.9 TOP: Quadratic-Linear Systems
- 31 ANS:
 $-5(x - 7) < 15$
 $x - 7 > -3$
 $x > 4$
- PTS: 2 REF: 061331ia STA: A.A.24 TOP: Solving Inequalities
- 32 ANS:
 $V = \pi r^2 h = \pi \cdot 6.5^2 \cdot 24 = 1014\pi$
- PTS: 2 REF: 061332ia STA: A.G.2 TOP: Volume

33 ANS:

$$t = \frac{d}{s} = \frac{136,000,000}{31,000} \approx 4387.1 \text{ hours. } \frac{4387.1}{24} \approx 183$$

PTS: 2 REF: 061333ia STA: A.M.1 TOP: Speed

34 ANS:

$$5 \times 3 \times 5 \times 3 = 225. \quad 1 \times 3 \times 5 \times 3 = 45. \quad 1 \times 2 \times 5 \times 3 = 30$$

PTS: 4 REF: 061334ia STA: A.N.7 TOP: Multiplication Counting Principle

35 ANS:

$$\tan x = \frac{350}{1000}$$

$$x \approx 19$$

PTS: 3 REF: 061335ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

36 ANS:

$$5 - 2\sqrt{3} + \sqrt{9}\sqrt{3} + 2(3) = 5 - 2\sqrt{3} + 3\sqrt{3} + 6 = 11 + \sqrt{3}$$

PTS: 3 REF: 061336ia STA: A.N.3 TOP: Operations with Radicals

37 ANS:

$$\frac{2}{3x} + \frac{12}{3x} = \frac{7}{x+1}$$

$$\frac{14}{3x} = \frac{7}{x+1}$$

$$21x = 14x + 14$$

$$7x = 14$$

$$x = 2$$

PTS: 4 REF: 061337ia STA: A.A.26 TOP: Solving Rationals

38 ANS:

$$\frac{5}{8} \times \frac{3}{7} = \frac{15}{56}. \quad \frac{5}{8} \times \frac{4}{7} = \frac{20}{56}. \quad \frac{20}{56} + \frac{3}{8} \times \frac{2}{7} = \frac{26}{56}$$

PTS: 4 REF: 061338ia STA: A.S.23 TOP: Theoretical Probability

KEY: dependent events

39 ANS:

$$\text{Area of rectangle minus area of semicircle: } (5 + 6 + 5) \times 5 - \frac{\pi \times 3^2}{2} \approx 65.86$$

PTS: 4 REF: 061339ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: area