

0609ia

- 1 It takes Tammy 45 minutes to ride her bike 5 miles. At this rate, how long will it take her to ride 8 miles?
- 1) 0.89 hour
 - 2) 1.125 hours
 - 3) 48 minutes
 - 4) 72 minutes

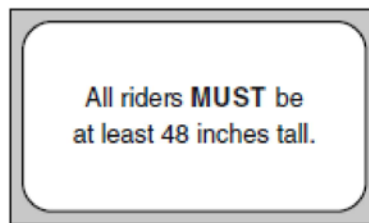
- 2 What are the roots of the equation $x^2 - 7x + 6 = 0$?
- 1) 1 and 7
 - 2) -1 and 7
 - 3) -1 and -6
 - 4) 1 and 6

- 3 Which expression represents $\frac{27x^{18}y^5}{9x^6y}$ in simplest form?
- 1) $3x^{12}y^4$
 - 2) $3x^3y^5$
 - 3) $18x^{12}y^4$
 - 4) $18x^3y^5$

- 4 Marie currently has a collection of 58 stamps. If she buys s stamps each week for w weeks, which expression represents the total number of stamps she will have?
- 1) $58sw$
 - 2) $58 + sw$
 - 3) $58s + w$
 - 4) $58 + s + w$

- 5 Which data set describes a situation that could be classified as qualitative?
- 1) the ages of the students in Ms. Marshall's Spanish class
 - 2) the test scores of the students in Ms. Fitzgerald's class
 - 3) the favorite ice cream flavor of each of Mr. Hayden's students
 - 4) the heights of the players on the East High School basketball team

- 6 The sign shown below is posted in front of a roller coaster ride at the Wadsworth County Fairgrounds.



If h represents the height of a rider in inches, what is a correct translation of the statement on this sign?

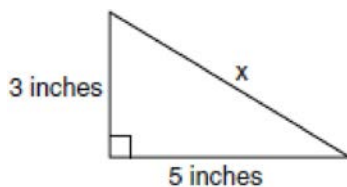
- 1) $h < 48$
 - 2) $h > 48$
 - 3) $h \leq 48$
 - 4) $h \geq 48$
- 7 Which value of x is the solution of the equation $\frac{2x}{3} + \frac{x}{6} = 5$?
- 1) 6
 - 2) 10
 - 3) 15
 - 4) 30

- 8 Students in Ms. Nazzeer's mathematics class tossed a six-sided number cube whose faces are numbered 1 to 6. The results are recorded in the table below.

Result	Frequency
1	3
2	6
3	4
4	6
5	4
6	7

Based on these data, what is the empirical probability of tossing a 4?

- 1) $\frac{8}{30}$
 - 2) $\frac{6}{30}$
 - 3) $\frac{5}{30}$
 - 4) $\frac{1}{30}$
- 9 What is the value of x , in inches, in the right triangle below?



- 1) $\sqrt{15}$
- 2) 8
- 3) $\sqrt{34}$
- 4) 4

- 10 What is $\sqrt{32}$ expressed in simplest radical form?

- 1) $16\sqrt{2}$
- 2) $4\sqrt{2}$
- 3) $4\sqrt{8}$
- 4) $2\sqrt{8}$

- 11 If the speed of sound is 344 meters per second, what is the approximate speed of sound, in meters per hour?

60 seconds = 1 minute
60 minutes = 1 hour

- 1) 20,640
- 2) 41,280
- 3) 123,840
- 4) 1,238,400

- 12 The sum of two numbers is 47, and their difference is 15. What is the larger number?

- 1) 16
- 2) 31
- 3) 32
- 4) 36

- 13 If $a + ar = b + r$, the value of a in terms of b and r can be expressed as

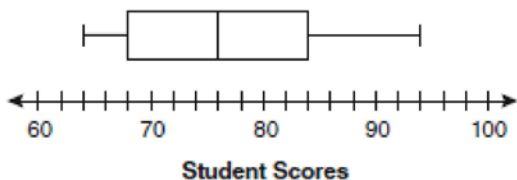
- 1) $\frac{b}{r} + 1$
- 2) $\frac{1+b}{r}$
- 3) $\frac{b+r}{1+r}$
- 4) $\frac{1+b}{r+b}$

- 14 Which value of x is in the solution set of

$$\frac{4}{3}x + 5 < 17?$$

- 1) 8
- 2) 9
- 3) 12
- 4) 16

- 15 The box-and-whisker plot below represents students' scores on a recent English test.



What is the value of the upper quartile?

- 1) 68
- 2) 76
- 3) 84
- 4) 94

- 16 Which value of n makes the expression $\frac{5n}{2n-1}$

undefined?

- 1) 1
- 2) 0
- 3) $-\frac{1}{2}$
- 4) $\frac{1}{2}$

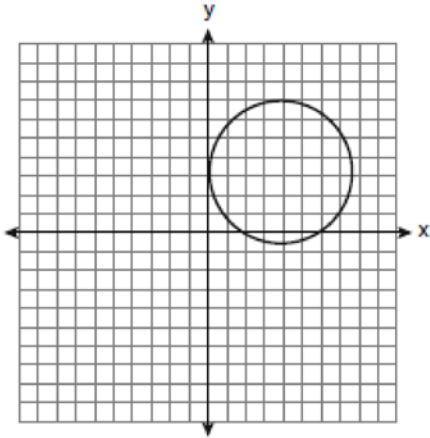
- 17 At Genesee High School, the sophomore class has 60 more students than the freshman class. The junior class has 50 fewer students than twice the students in the freshman class. The senior class is three times as large as the freshman class. If there are a total of 1,424 students at Genesee High School, how many students are in the freshman class?

- 1) 202
- 2) 205
- 3) 235
- 4) 236

- 18 What are the vertex and axis of symmetry of the parabola $y = x^2 - 16x + 63$?

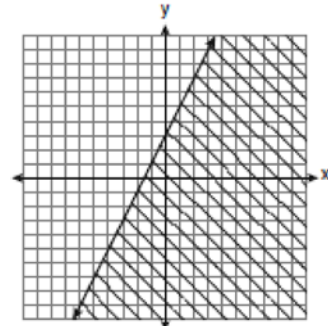
- 1) vertex: $(8, -1)$; axis of symmetry: $x = 8$
- 2) vertex: $(8, 1)$; axis of symmetry: $x = 8$
- 3) vertex: $(-8, -1)$; axis of symmetry: $x = -8$
- 4) vertex: $(-8, 1)$; axis of symmetry: $x = -8$

19 Which statement is true about the relation shown on the graph below?

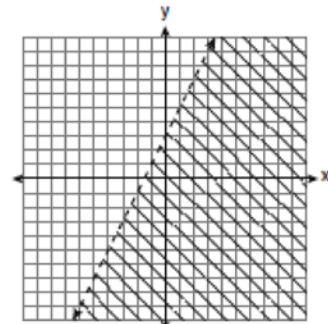


- 1) It is a function because there exists one x -coordinate for each y -coordinate.
- 2) It is a function because there exists one y -coordinate for each x -coordinate.
- 3) It is *not* a function because there are multiple y -values for a given x -value.
- 4) It is *not* a function because there are multiple x -values for a given y -value.

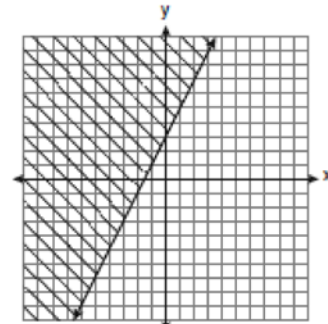
20 Which graph represents the solution of $3y - 9 \leq 6x$?



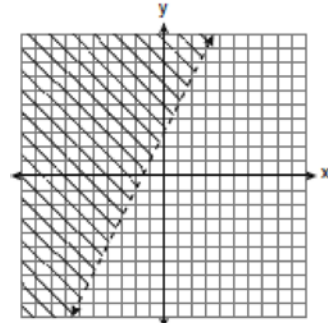
1)



2)



3)



4)

21 Which expression represents $\frac{x^2 - 2x - 15}{x^2 + 3x}$ in

simplest form?

- 1) -5
- 2) $\frac{x - 5}{x}$
- 3) $\frac{-2x - 5}{x}$
- 4) $\frac{-2x - 15}{3x}$

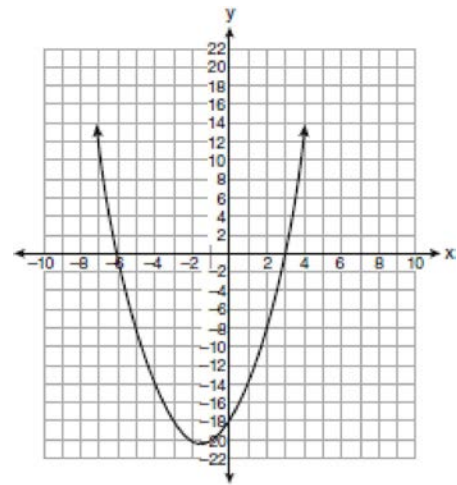
22 What is an equation of the line that passes through the point $(4, -6)$ and has a slope of -3 ?

- 1) $y = -3x + 6$
- 2) $y = -3x - 6$
- 3) $y = -3x + 10$
- 4) $y = -3x + 14$

23 When $4x^2 + 7x - 5$ is subtracted from $9x^2 - 2x + 3$, the result is

- 1) $5x^2 + 5x - 2$
- 2) $5x^2 - 9x + 8$
- 3) $-5x^2 + 5x - 2$
- 4) $-5x^2 + 9x - 8$

24 The equation $y = x^2 + 3x - 18$ is graphed on the set of axes below.



Based on this graph, what are the roots of the equation $x^2 + 3x - 18 = 0$?

- 1) -3 and 6
- 2) 0 and -18
- 3) 3 and -6
- 4) 3 and -18

25 What is the value of the y -coordinate of the solution to the system of equations $x + 2y = 9$ and $x - y = 3$?

- 1) 6
- 2) 2
- 3) 3
- 4) 5

26 What is the additive inverse of the expression $a - b$?

- 1) $a + b$
- 2) $a - b$
- 3) $-a + b$
- 4) $-a - b$

27 What is the product of 12 and 4.2×10^6 expressed in scientific notation?

- 1) 50.4×10^6
- 2) 50.4×10^7
- 3) 5.04×10^6
- 4) 5.04×10^7

28 To calculate the volume of a small wooden cube, Ezra measured an edge of the cube as 2 cm. The actual length of the edge of Ezra's cube is 2.1 cm. What is the relative error in his volume calculation to the nearest hundredth?

- 1) 0.13
- 2) 0.14
- 3) 0.15
- 4) 0.16

29 What is $\frac{6}{4a} - \frac{2}{3a}$ expressed in simplest form?

- 1) $\frac{4}{a}$
- 2) $\frac{5}{6a}$
- 3) $\frac{8}{7a}$
- 4) $\frac{10}{12a}$

30 The set $\{11, 12\}$ is equivalent to

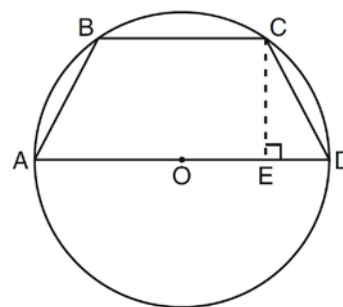
- 1) $\{x \mid 11 < x < 12, \text{ where } x \text{ is an integer}\}$
- 2) $\{x \mid 11 < x \leq 12, \text{ where } x \text{ is an integer}\}$
- 3) $\{x \mid 10 \leq x < 12, \text{ where } x \text{ is an integer}\}$
- 4) $\{x \mid 10 < x \leq 12, \text{ where } x \text{ is an integer}\}$

31 Determine how many three-letter arrangements are possible with the letters $A, N, G, L,$ and E if no letter may be repeated.

32 Factor completely: $4x^3 - 36x$

33 Some books are laid on a desk. Two are English, three are mathematics, one is French, and four are social studies. Theresa selects an English book and Isabelle then selects a social studies book. Both girls take their selections to the library to read. If Truman then selects a book at random, what is the probability that he selects an English book?

34 In the diagram below, the circumference of circle O is 16π inches. The length of \overline{BC} is three-quarters of the length of diameter \overline{AD} and $CE = 4$ inches. Calculate the area, in square inches, of trapezoid $ABCD$.



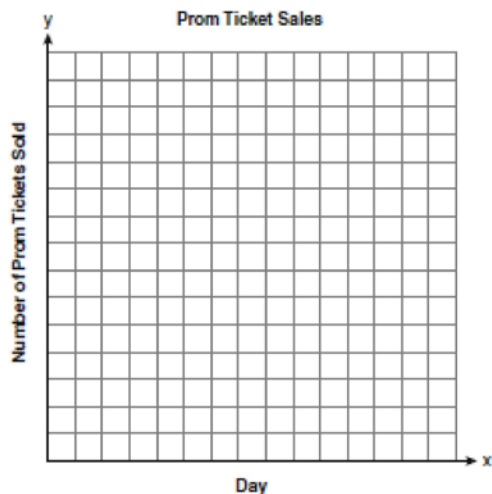
35 A bank is advertising that new customers can open a savings account with a $3\frac{3}{4}\%$ interest rate compounded annually. Robert invests \$5,000 in an account at this rate. If he makes no additional deposits or withdrawals on his account, find the amount of money he will have, to the *nearest cent*, after three years.

36 The table below shows the number of prom tickets sold over a ten-day period.

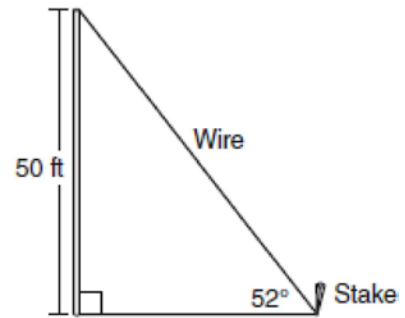
Prom Ticket Sales

Day (x)	1	2	5	7	10
Number of Prom Tickets Sold (y)	30	35	55	60	70

Plot these data points on the coordinate grid below. Use a consistent and appropriate scale. Draw a reasonable line of best fit and write its equation.



37 A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of 52° .



How far away from the base of the pole should the stake be driven in, to the *nearest foot*? What will be the length of the wire from the stake to the top of the pole, to the *nearest foot*?

Integrated Algebra Regents Exam 0609

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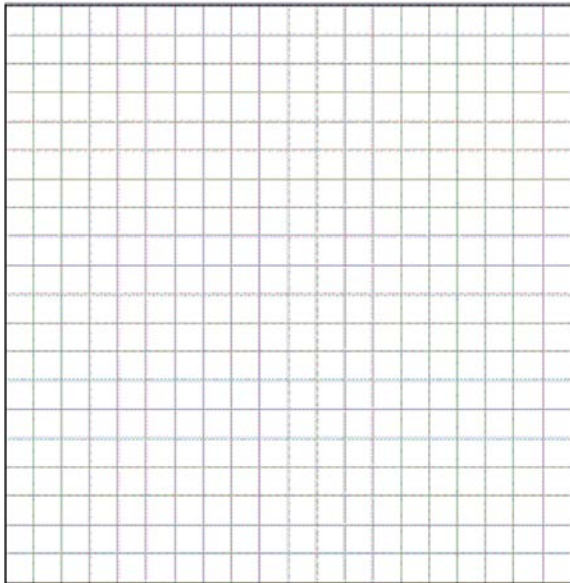
- 38 The Fahrenheit temperature readings on 30 April mornings in Stormville, New York, are shown below.

41°, 58°, 61°, 54°, 49°, 46°, 52°, 58°, 67°, 43°,
 47°, 60°, 52°, 58°, 48°, 44°, 59°, 66°, 62°, 55°,
 44°, 49°, 62°, 61°, 59°, 54°, 57°, 58°, 63°, 60°

Using the data, complete the frequency table below.

Interval	Tally	Frequency
40–44		
45–49		
50–54		
55–59		
60–64		
65–69		

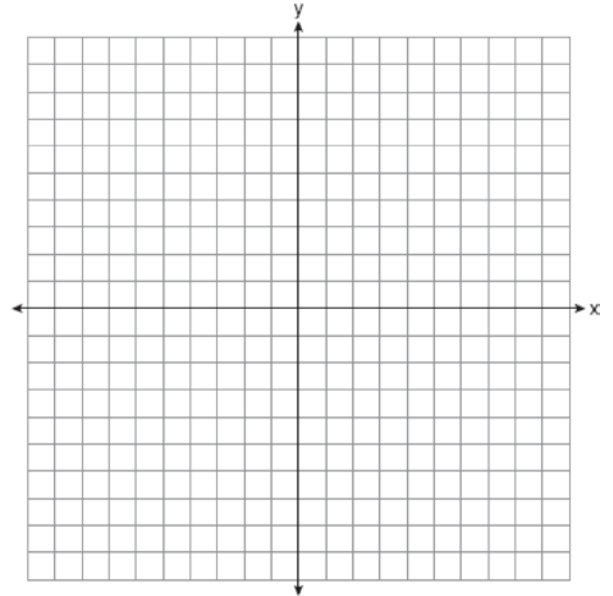
On the grid below, construct and label a frequency histogram based on the table.



- 39 On the set of axes below, solve the following system of equations graphically for all values of x and y .

$$y = x^2 - 6x + 1$$

$$y + 2x = 6$$



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Answer Section

1 ANS: 4

$$\frac{5}{45} = \frac{8}{x}$$

$$5x = 360$$

$$x = 72$$

PTS: 2

REF: 060901ia

STA: A.M.1

TOP: Speed

2 ANS: 4

$$x^2 - 7x + 6 = 0$$

$$(x - 6)(x - 1) = 0$$

$$x = 6 \quad x = 1$$

PTS: 2

REF: 060902ia

STA: A.A.28

TOP: Roots of Quadratics

3 ANS: 1

PTS: 2

REF: 060903ia

STA: A.A.12

TOP: Division of Powers

4 ANS: 2

PTS: 2

REF: 060904ia

STA: A.A.1

TOP: Expressions

5 ANS: 3

The other situations are quantitative.

PTS: 2

REF: 060905ia

STA: A.S.1

TOP: Analysis of Data

6 ANS: 4

PTS: 2

REF: 060906ia

STA: A.A.4

TOP: Modeling Inequalities

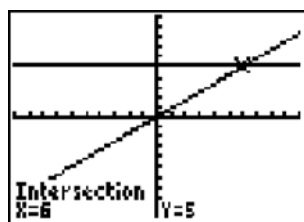
7 ANS: 1

$$\frac{(2x \times 6) + (3 \times x)}{3 \times 6} = 5$$

$$\frac{12x + 3x}{18} = 5$$

$$15x = 90$$

$$x = 6$$



PTS: 2

REF: 060907ia

STA: A.A.25

TOP: Solving Equations with Fractional Expressions

8 ANS: 2

PTS: 2

REF: 060908ia

STA: A.S.21

TOP: Empirical Probability

- 9 ANS: 3
 $3^2 + 5^2 = x^2$
 $34 = x^2$
 $\sqrt{34} = x$
- PTS: 2 REF: 060909ia STA: A.A.45 TOP: Pythagorean Theorem
- 10 ANS: 2
 $\sqrt{32} = \sqrt{16} \sqrt{2} = 4\sqrt{2}$
- PTS: 2 REF: 060910ia STA: A.N.2 TOP: Simplifying Radicals
- 11 ANS: 4
 $\frac{344 \text{ m}}{\text{sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} = 1,238,400 \frac{\text{m}}{\text{hr}}$
- PTS: 2 REF: 060911ia STA: A.M.2 TOP: Conversions
- 12 ANS: 2
 $L + S = 47$
 $L - S = 15$
 $2L = 62$
 $L = 31$
- PTS: 2 REF: 060912ia STA: A.A.7 TOP: Writing Linear Systems
- 13 ANS: 3
 $a + ar = b + r$
 $a(1 + r) = b + r$
 $a = \frac{b + r}{1 + r}$
- PTS: 2 REF: 060913ia STA: A.A.23 TOP: Transforming Formulas
- 14 ANS: 1
 $\frac{4}{3}x + 5 < 17$
 $\frac{4}{3}x < 12$
 $4x < 36$
 $x < 9$
- PTS: 2 REF: 060914ia STA: A.A.21 TOP: Interpreting Solutions
- 15 ANS: 3
The value of the upper quartile is the last vertical line of the box.
- PTS: 2 REF: 060915ia STA: A.S.6 TOP: Box-and-Whisker Plots
- 16 ANS: 4 PTS: 2 REF: 060916ia STA: A.A.15
TOP: Undefined Rationals

17 ANS: 1

$$so = f + 60 \quad j = 2f - 50 \quad se = 3f. \quad f + (f + 60) + (2f - 50) + 3f = 1424$$

$$7f + 10 = 1424$$

$$f = 202$$

PTS: 2

REF: 060917ia

STA: A.A.7

TOP: Writing Linear Systems

18 ANS: 1

$$x = \frac{-b}{2a} = \frac{-(-16)}{2(1)} = 8. \quad y = (8)^2 - 16(8) + 63 = -1$$

PTS: 2

REF: 060918ia

STA: A.A.41

TOP: Identifying the Vertex of a Quadratic Given Equation

19 ANS: 3

PTS: 2

REF: 060919ia

STA: A.G.3

TOP: Defining Functions

20 ANS: 1

PTS: 2

REF: 060920ia

STA: A.G.6

TOP: Linear Inequalities

21 ANS: 2

$$\frac{x^2 - 2x - 15}{x^2 + 3x} = \frac{(x - 5)(x + 3)}{x(x + 3)} = \frac{x - 5}{x}$$

PTS: 2

REF: 060921ia

STA: A.A.16

TOP: Rational Expressions

KEY: $a > 0$

22 ANS: 1

$$y = mx + b$$

$$-6 = (-3)(4) + b$$

$$b = 6$$

PTS: 2

REF: 060922ia

STA: A.A.34

TOP: Writing Linear Equations

23 ANS: 2

PTS: 2

REF: 060923ia

STA: A.A.13

TOP: Addition and Subtraction of Polynomials

KEY: subtraction

24 ANS: 3

PTS: 2

REF: 060924ia

STA: A.G.8

TOP: Solving Quadratics by Graphing

25 ANS: 2

$$x + 2y = 9$$

$$x - y = 3$$

$$3y = 6$$

$$y = 2$$

PTS: 2

REF: 060925ia

STA: A.A.10

TOP: Solving Linear Systems

26 ANS: 3

PTS: 2

REF: 060926ia

STA: A.N.1

TOP: Properties of Reals

27 ANS: 4

PTS: 2

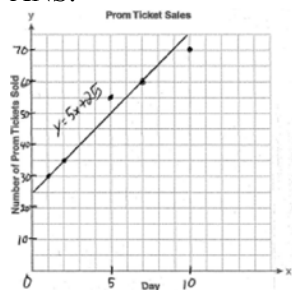
REF: 060927ia

STA: A.N.4

TOP: Operations with Scientific Notation

- 28 ANS: 2
The volume of the cube using Ezra's measurements is $8 (2^3)$. The actual volume is $9.261 (2.1^3)$. The relative error is $\left| \frac{9.261 - 8}{9.261} \right| \approx 0.14$.
- PTS: 2 REF: 060928ia STA: A.M.3 TOP: Error
- 29 ANS: 2
 $\frac{6}{4a} - \frac{2}{3a} = \frac{18a - 8a}{12a^2} = \frac{10a}{12a^2} = \frac{5}{6a}$
- PTS: 2 REF: 060929ia STA: A.A.17 TOP: Addition and Subtraction of Rationals
- 30 ANS: 4 PTS: 2 REF: 060930ia STA: A.A.29
TOP: Set Theory
- 31 ANS:
60. ${}_5P_3 = 60$
- PTS: 2 REF: 060931ia STA: A.N.8 TOP: Permutations
- 32 ANS:
 $4x(x+3)(x-3)$. $4x^3 - 36x = 4x(x^2 - 9) = 4x(x+3)(x-3)$
- PTS: 2 REF: 060932ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares
- 33 ANS:
 $\frac{1}{8}$. After the English and social studies books are taken, 8 books are left and 1 is an English book.
- PTS: 2 REF: 060933ia STA: A.S.18 TOP: Conditional Probability
- 34 ANS:
56. If the circumference of circle O is 16π inches, the diameter, \overline{AD} , is 16 inches and the length of \overline{BC} is 12 inches $\frac{3}{4} \times 16$. The area of trapezoid $ABCD$ is $\frac{1}{2} \times 4(12 + 16) = 56$.
- PTS: 3 REF: 060934ia STA: A.G.1 TOP: Compositions of Polygons and Circles
- 35 ANS:
 $5,583.86$. $A = P(1 + R)^t = 5000(1 + 0.0375)^3 \approx 5583.86$
- PTS: 3 REF: 060935ia STA: A.A.9 TOP: Exponential Functions

36 ANS:



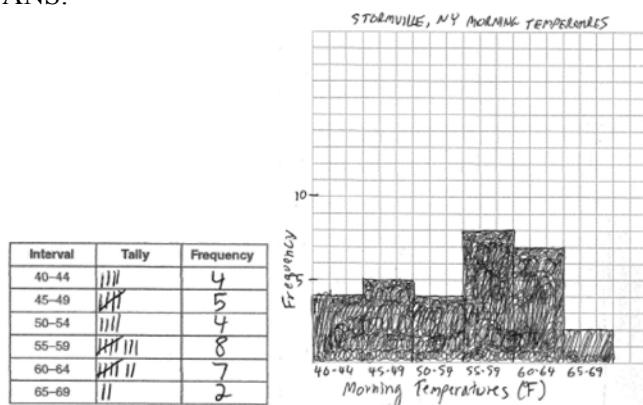
PTS: 3 REF: 060936ia STA: A.S.8 TOP: Scatter Plots

37 ANS:

39, 63. $\tan 52 = \frac{50}{x}$. $\sin 52 = \frac{50}{x}$
 $x \approx 39$ $x \approx 63$

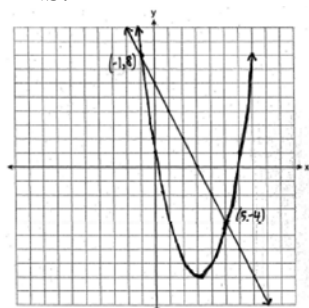
PTS: 4 REF: 060937ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

38 ANS:



PTS: 4 REF: 060938ia STA: A.S.5
 TOP: Frequency Histograms, Bar Graphs and Tables

39 ANS:



PTS: 4 REF: 060939ia STA: A.G.9 TOP: Quadratic-Linear Systems