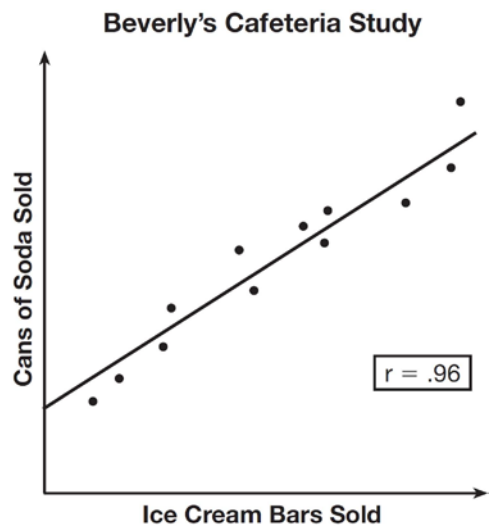


Algebra I Common Core State Standards Regents Bimodal Worksheets

1 A cell phone company charges \$60.00 a month for up to 1 gigabyte of data. The cost of additional data is \$0.05 per megabyte. If d represents the number of additional megabytes used and c represents the total charges at the end of the month, which linear equation can be used to determine a user's monthly bill?

2 Beverly did a study this past spring using data she collected from a cafeteria. She recorded data weekly for ice cream sales and soda sales. Beverly found the line of best fit and the correlation coefficient, as shown in the diagram below.



Given this information, which statement(s) can correctly be concluded?

- I. Eating more ice cream causes a person to become thirsty.
- II. Drinking more soda causes a person to become hungry.
- III. There is a strong correlation between ice cream sales and soda sales.

3 If $f(x) = \frac{1}{2}x^2 - \left(\frac{1}{4}x + 3\right)$, what is the value of $f(8)$?

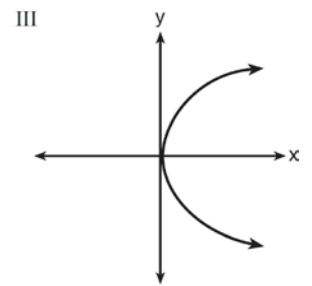
4 If $f(x) = \frac{\sqrt{2x+3}}{6x-5}$, then $f\left(\frac{1}{2}\right) =$

5 A construction worker needs to move 120 ft³ of dirt by using a wheelbarrow. One wheelbarrow load holds 8 ft³ of dirt and each load takes him 10 minutes to complete. One correct way to figure out the number of hours he would need to complete this job is

6 Which representations are functions?

I

| x | y |
|---|-----|
| 2 | 6 |
| 3 | -12 |
| 4 | 7 |
| 5 | 5 |
| 2 | -6 |



- II $\{(1,1), (2,1), (3,2), (4,3), (5,5), (6,8), (7,13)\}$ IV $y = 2x + 1$

7 Which value of x results in equal outputs for $j(x) = 3x - 2$ and $b(x) = |x + 2|$?

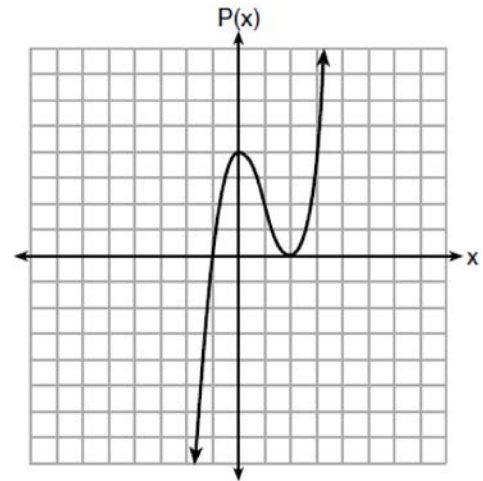
8 Milton has his money invested in a stock portfolio. The value, $v(x)$, of his portfolio can be modeled with the function $v(x) = 30,000(0.78)^x$, where x is the number of years since he made his investment. Which statement describes the rate of change of the value of his portfolio?

9 A company produces x units of a product per month, where $C(x)$ represents the total cost and $R(x)$ represents the total revenue for the month. The functions are modeled by $C(x) = 300x + 250$ and $R(x) = -0.5x^2 + 800x - 100$. The profit is the difference between revenue and cost where $P(x) = R(x) - C(x)$. What is the total profit, $P(x)$, for the month?

10 Connor wants to attend the town carnival. The price of admission to the carnival is \$4.50, and each ride costs an additional 79 cents. If he can spend at most \$16.00 at the carnival, which inequality can be used to solve for r , the number of rides Connor can go on, and what is the maximum number of rides he can go on?

11 Jordan works for a landscape company during his summer vacation. He is paid \$12 per hour for mowing lawns and \$14 per hour for planting gardens. He can work a maximum of 40 hours per week, and would like to earn at least \$250 this week. If m represents the number of hours mowing lawns and g represents the number of hours planting gardens, which system of inequalities could be used to represent the given conditions?

12 Wenona sketched the polynomial $P(x)$ as shown on the axes below.



Which equation could represent $P(x)$?

13 The distance a free falling object has traveled can be modeled by the equation $d = \frac{1}{2}at^2$, where a is acceleration due to gravity and t is the amount of time the object has fallen. What is t in terms of a and d ?

14 The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of r , in terms of h and V , is

15 If $f(x) = x^2 - 2x - 8$ and $g(x) = \frac{1}{4}x - 1$, for which value of x is $f(x) = g(x)$?

- 16 The table below shows the number of grams of carbohydrates, x , and the number of Calories, y , of six different foods.

| Carbohydrates (x) | Calories (y) |
|-----------------------|------------------|
| 8 | 120 |
| 9.5 | 138 |
| 10 | 147 |
| 6 | 88 |
| 7 | 108 |
| 4 | 62 |

Which equation best represents the line of best fit for this set of data?

- 17 A radio station did a survey to determine what kind of music to play by taking a sample of middle school, high school, and college students. They were asked which of three different types of music they prefer on the radio: hip-hop, alternative, or classic rock. The results are summarized in the table below.

| | Hip-Hop | Alternative | Classic Rock |
|---------------|---------|-------------|--------------|
| Middle School | 28 | 18 | 4 |
| High School | 22 | 22 | 6 |
| College | 16 | 20 | 14 |

What percentage of college students prefer classic rock?

- 18 During the 2010 season, football player McGee's earnings, m , were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, f . The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?
- 19 If the quadratic formula is used to find the roots of the equation $x^2 - 6x - 19 = 0$, the correct roots are
- 20 Natasha is planning a school celebration and wants to have live music and food for everyone who attends. She has found a band that will charge her \$750 and a caterer who will provide snacks and drinks for \$2.25 per person. If her goal is to keep the average cost per person between \$2.75 and \$3.25, how many people, p , must attend?
- 21 In 2014, the cost to mail a letter was 49¢ for up to one ounce. Every additional ounce cost 21¢. Which recursive function could be used to determine the cost of a 3-ounce letter, in cents?

- 22 The table below shows the average diameter of a pupil in a person's eye as he or she grows older.

| Age (years) | Average Pupil Diameter (mm) |
|-------------|-----------------------------|
| 20 | 4.7 |
| 30 | 4.3 |
| 40 | 3.9 |
| 50 | 3.5 |
| 60 | 3.1 |
| 70 | 2.7 |
| 80 | 2.3 |

What is the average rate of change, in millimeters per year, of a person's pupil diameter from age 20 to age 80?

- 23 A student is asked to solve the equation $4(3x - 1)^2 - 17 = 83$. The student's solution to the problem starts as $4(3x - 1)^2 = 100$
- $$(3x - 1)^2 = 25$$
- A correct next step in the solution of the problem is
- 24 Miriam and Jessica are growing bacteria in a laboratory. Miriam uses the growth function $f(t) = n^{2t}$ while Jessica uses the function $g(t) = n^{4t}$, where n represents the initial number of bacteria and t is the time, in hours. If Miriam starts with 16 bacteria, how many bacteria should Jessica start with to achieve the same growth over time?
- 25 The expression $3(x^2 - 1) - (x^2 - 7x + 10)$ is equivalent to
- 26 The zeros of the function $f(x) = 2x^3 + 12x - 10x^2$ are
- 27 Fred is given a rectangular piece of paper. If the length of Fred's piece of paper is represented by $2x - 6$ and the width is represented by $3x - 5$, then the paper has a total area represented by
- 28 The length of the shortest side of a right triangle is 8 inches. The lengths of the other two sides are represented by consecutive odd integers. Which equation could be used to find the lengths of the other sides of the triangle?
- 29 What is the solution to $2h + 8 > 3h - 6$

- 30 A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing r radios is given by the function $c(r) = 5.25r + 125$, then the value 5.25 best represents

- 31 The formula for the surface area of a right rectangular prism is $A = 2lw + 2hw + 2lh$, where l , w , and h represent the length, width, and height, respectively. Which term of this formula is *not* dependent on the height?

- 32 In 2013, the United States Postal Service charged \$0.46 to mail a letter weighing up to 1 oz. and \$0.20 per ounce for each additional ounce. Which function would determine the cost, in dollars, $c(z)$, of mailing a letter weighing z ounces where z is an integer greater than 1?

- 33 The solution of the equation $(x + 3)^2 = 7$ is

- 34 The zeros of the function $f(x) = x^2 - 5x - 6$ are

- 35 The inequality $7 - \frac{2}{3}x < x - 8$ is equivalent to

- 36 Given the following expressions:

I. $-\frac{5}{8} + \frac{3}{5}$ III. $(\sqrt{5}) \cdot (\sqrt{5})$

II. $\frac{1}{2} + \sqrt{2}$ IV. $3 \cdot (\sqrt{49})$

Which expression(s) result in an irrational number?

- 37 How many of the equations listed below represent the line passing through the points (2,3) and (4,-7)?

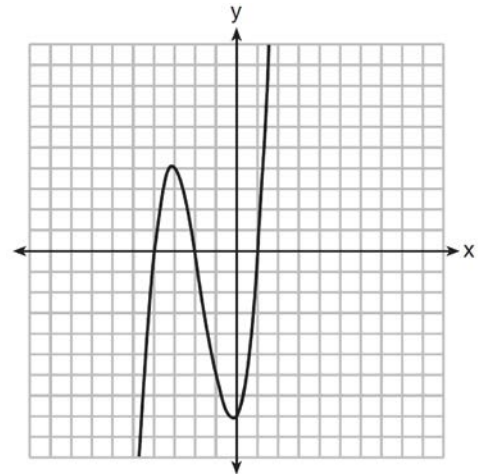
$$5x + y = 13$$

$$y + 7 = -5(x - 4)$$

$$y = -5x + 13$$

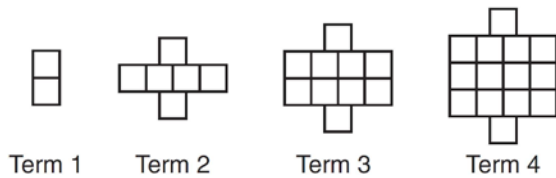
$$y - 7 = 5(x - 4)$$

- 38 The graph of $f(x)$ is shown below.



Which function could represent the graph of $f(x)$?

39 A pattern of blocks is shown below.



If the pattern of blocks continues, which formula(s) could be used to determine the number of blocks in the n th term?

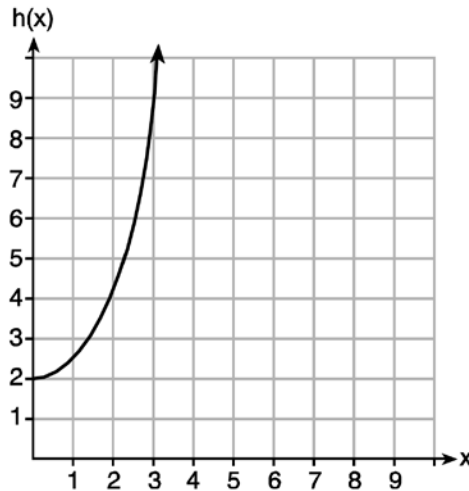
| I | II | III |
|---------------|----------------------------------|----------------|
| $a_n = n + 4$ | $a_1 = 2$ $a_n = a_{n-1} + 4$ | $a_n = 4n - 2$ |

- 40 Which value of x is a solution to the equation $13 - 36x^2 = -12$?
- 41 Which function defines the sequence $-6, -10, -14, -18, \dots$, where $f(6) = -26$?
- 42 The function $V(t) = 1350(1.017)^t$ represents the value $V(t)$, in dollars, of a comic book t years after its purchase. The yearly rate of appreciation of the comic book is
- 43 Dan took 12.5 seconds to run the 100-meter dash. He calculated the time to be approximately
- 44 What is the largest integer, x , for which the value of $f(x) = 5x^4 + 30x^2 + 9$ will be greater than the value of $g(x) = 3^x$?
- 45 Andy has \$310 in his account. Each week, w , he withdraws \$30 for his expenses. Which expression could be used if he wanted to find out how much money he had left after 8 weeks?
- 46 Some banks charge a fee on savings accounts that are left inactive for an extended period of time. The equation $y = 5000(0.98)^x$ represents the value, y , of one account that was left inactive for a period of x years. What is the y -intercept of this equation and what does it represent?

47 Given the functions $g(x)$, $f(x)$, and $h(x)$ shown below:

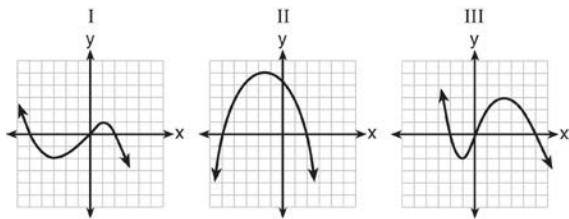
$$g(x) = x^2 - 2x$$

| x | $f(x)$ |
|-----|--------|
| 0 | 1 |
| 1 | 2 |
| 2 | 5 |
| 3 | 7 |



The correct list of functions ordered from greatest to least by average rate of change over the interval $0 \leq x \leq 3$ is

48 A polynomial function contains the factors x , $x - 2$, and $x + 5$. Which graph(s) below could represent the graph of this function?



49 If $4x^2 - 100 = 0$, the roots of the equation are

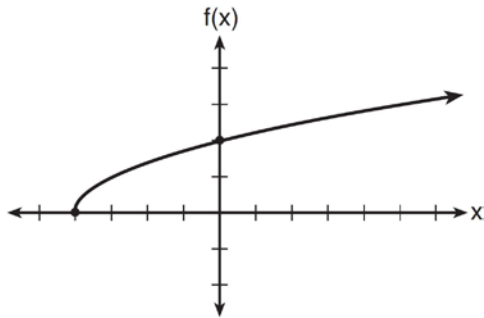
50 The value of the x -intercept for the graph of $4x - 5y = 40$ is

51 Which trinomial is equivalent to $3(x - 2)^2 - 2(x - 1)$?

52 A typical cell phone plan has a fixed base fee that includes a certain amount of data and an overage charge for data use beyond the plan. A cell phone plan charges a base fee of \$62 and an overage charge of \$30 per gigabyte of data that exceed 2 gigabytes. If C represents the cost and g represents the total number of gigabytes of data, which equation could represent this plan when more than 2 gigabytes are used?

53 The function $f(x) = 3x^2 + 12x + 11$ can be written in vertex form as

54 The graph of the function $f(x) = \sqrt{x+4}$ is shown below.



The domain of the function is

55 A part of Jennifer's work to solve the equation $2(6x^2 - 3) = 11x^2 - x$ is shown below.

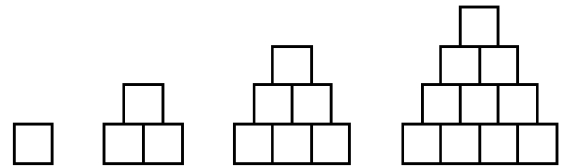
Given: $2(6x^2 - 3) = 11x^2 - x$

Step 1: $12x^2 - 6 = 11x^2 - x$

Which property justifies her first step?

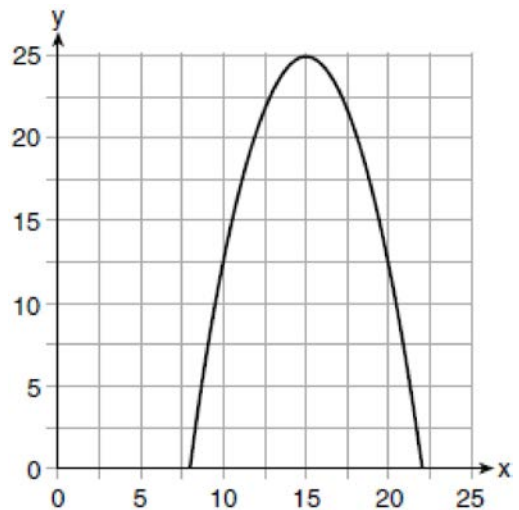
56 For which function defined by a polynomial are the zeros of the polynomial -4 and -6 ?

57 A sequence of blocks is shown in the diagram below.



This sequence can be defined by the recursive function $a_1 = 1$ and $a_n = a_{n-1} + n$. Assuming the pattern continues, how many blocks will there be when $n = 7$?

58 The graph of a quadratic function is shown below.



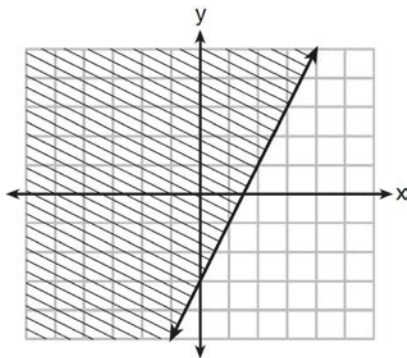
An equation that represents the function could be

- 59 A laboratory technician studied the population growth of a colony of bacteria. He recorded the number of bacteria every other day, as shown in the partial table below.

| | | | |
|--------------------------|----|--------|-----------|
| t (time, in days) | 0 | 2 | 4 |
| f(t) (bacteria) | 25 | 15,625 | 9,765,625 |

Which function would accurately model the technician's data?

- 60 When factored completely, the expression $p^4 - 81$ is equivalent to
- 61 Given the graph of the line represented by the equation $f(x) = -2x + b$, if b is increased by 4 units, the graph of the new line would be shifted 4 units
- 62 Which inequality is represented by the graph below?
- 63 What are the solutions to the equation $x^2 - 8x = 24$?
- 64 The function $h(t) = -16t^2 + 144$ represents the height, $h(t)$, in feet, of an object from the ground at t seconds after it is dropped. A realistic domain for this function is
- 65 Krystal was given \$3000 when she turned 2 years old. Her parents invested it at a 2% interest rate compounded annually. No deposits or withdrawals were made. Which expression can be used to determine how much money Krystal had in the account when she turned 18?



- 66 For a recently released movie, the function $y = 119.67(0.61)^x$ models the revenue earned, y , in millions of dollars each week, x , for several weeks after its release. Based on the equation, how much more money, in millions of dollars, was earned in revenue for week 3 than for week 5?
- 67 Sara was asked to solve this word problem: "The product of two consecutive integers is 156. What are the integers?" What type of equation should she create to solve this problem?

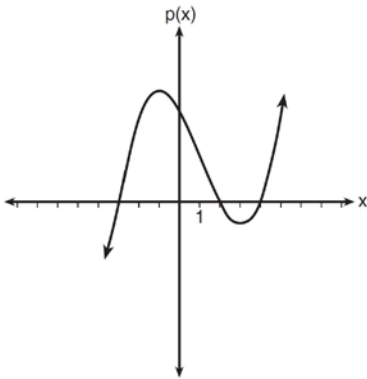
- 68 Joey enlarged a 3-inch by 5-inch photograph on a copy machine. He enlarged it four times. The table below shows the area of the photograph after each enlargement.

| Enlargement | 0 | 1 | 2 | 3 | 4 |
|----------------------|----|------|------|------|------|
| Area (square inches) | 15 | 18.8 | 23.4 | 29.3 | 36.6 |

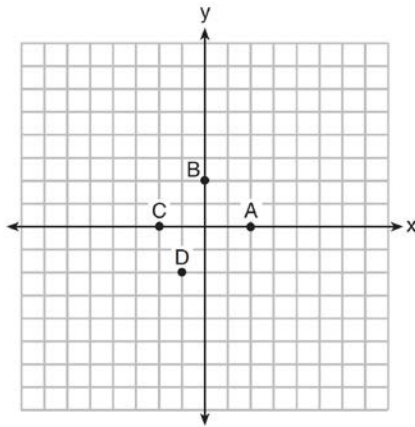
What is the average rate of change of the area from the original photograph to the fourth enlargement, to the nearest tenth?

- 69 When factored completely, $x^3 - 13x^2 - 30x$ is
- 70 Michael borrows money from his uncle, who is charging him simple interest using the formula $I = Prt$. To figure out what the interest rate, r , is, Michael rearranges the formula to find r . His new formula is r equals
- 71 Sam and Jeremy have ages that are consecutive odd integers. The product of their ages is 783. Which equation could be used to find Jeremy's age, j , if he is the younger man?
- 72 A plumber has a set fee for a house call and charges by the hour for repairs. The total cost of her services can be modeled by $c(t) = 125t + 95$. Which statements about this function are true?
I. A house call fee costs \$95.
II. The plumber charges \$125 per hour.
III. The number of hours the job takes is represented by t .
- 73 Anne invested \$1000 in an account with a 1.3% annual interest rate. She made no deposits or withdrawals on the account for 2 years. If interest was compounded annually, which equation represents the balance in the account after the 2 years?
- 74 An astronaut drops a rock off the edge of a cliff on the Moon. The distance, $d(t)$, in meters, the rock travels after t seconds can be modeled by the function $d(t) = 0.8t^2$. What is the average speed, in meters per second, of the rock between 5 and 10 seconds after it was dropped?
- 75 John has four more nickels than dimes in his pocket, for a total of \$1.25. Which equation could be used to determine the number of dimes, x , in his pocket?
- 76 In the function $f(x) = (x - 2)^2 + 4$, the minimum value occurs when x is

- 77 Based on the graph below, which expression is a possible factorization of $p(x)$?



- 78 The graph of $y = f(x)$ is shown below.



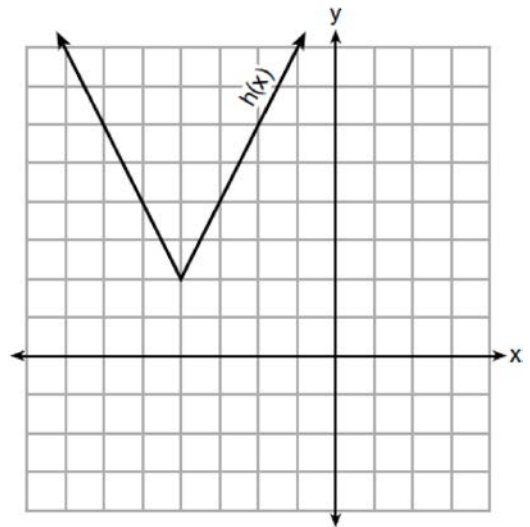
Which point could be used to find $f(2)$?

- 79 Which expression is equivalent to $x^4 - 12x^2 + 36$?

- 80 If a sequence is defined recursively by $f(0) = 2$ and $f(n + 1) = -2f(n) + 3$ for $n \geq 0$, then $f(2)$ is equal to

- 81 A store sells self-serve frozen yogurt sundaes. The function $C(w)$ represents the cost, in dollars, of a sundae weighing w ounces. An appropriate domain for the function would be

- 82 The function $h(x)$, which is graphed below, and the function $g(x) = 2|x + 4| - 3$ are given.



Which statements about these functions are true?

- I. $g(x)$ has a lower minimum value than $h(x)$.
- II. For all values of x , $h(x) < g(x)$.
- III. For any value of x , $g(x) \neq h(x)$.

- 83 A construction company uses the function $f(p)$, where p is the number of people working on a project, to model the amount of money it spends to complete a project. A reasonable domain for this function would be

- 84 The line represented by the equation $4y + 2x = 33.6$ shares a solution point with the line represented by the table below.

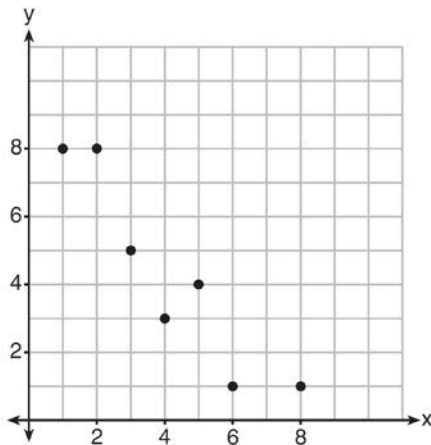
| x | y |
|----|-----|
| -5 | 3.2 |
| -2 | 3.8 |
| 2 | 4.6 |
| 4 | 5 |
| 11 | 6.4 |

The solution for this system is

- 85 The value in dollars, $v(x)$, of a certain car after x years is represented by the equation $v(x) = 25,000(0.86)^x$. To the *nearest dollar*, how much more is the car worth after 2 years than after 3 years?

- 87 Given the functions $h(x) = \frac{1}{2}x + 3$ and $j(x) = |x|$, which value of x makes $h(x) = j(x)$?

- 86 What is the correlation coefficient of the linear fit of the data shown below, to the *nearest hundredth*?



- 88 Faith wants to use the formula $C(f) = \frac{5}{9}(f - 32)$ to convert degrees Fahrenheit, f , to degrees Celsius, $C(f)$. If Faith calculated $C(68)$, what would her result be?

- 89 Konnor wants to burn 250 Calories while exercising for 45 minutes at the gym. On the treadmill, he can burn 6 Cal/min. On the stationary bike, he can burn 5 Cal/min. If t represents the number of minutes on the treadmill and b represents the number of minutes on the stationary bike, which expression represents the number of Calories that Konnor can burn on the stationary bike?

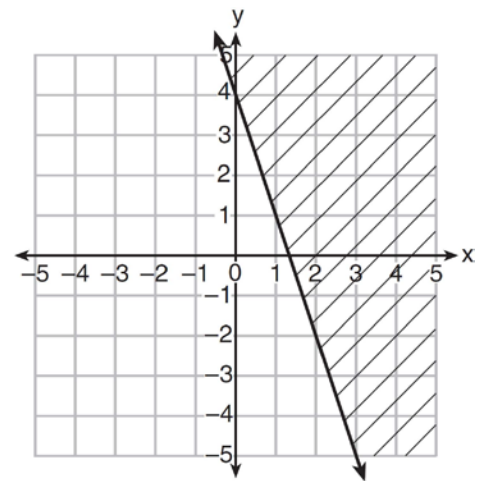
- 90 A public opinion poll was taken to explore the relationship between age and support for a candidate in an election. The results of the poll are summarized in the table below.

| Age | For | Against | No Opinion |
|---------|-----|---------|------------|
| 21-40 | 30 | 12 | 8 |
| 41-60 | 20 | 40 | 15 |
| Over 60 | 25 | 35 | 15 |

What percent of the 21-40 age group was for the candidate?

- 91 If Lylah completes the square for $f(x) = x^2 - 12x + 7$ in order to find the minimum, she must write $f(x)$ in the general form $f(x) = (x - a)^2 + b$. What is the value of a for $f(x)$?

- 95 Which inequality is represented in the graph below?



- 92 If the area of a rectangle is expressed as $x^4 - 9y^2$, then the product of the length and the width of the rectangle could be expressed as
- 93 The owner of a small computer repair business has one employee, who is paid an hourly rate of \$22. The owner estimates his weekly profit using the function $P(x) = 8600 - 22x$. In this function, x represents the number of
- 94 Which domain would be the most appropriate set to use for a function that predicts the number of household online-devices in terms of the number of people in the household?

- 96 Grisham is considering the three situations below.
- I. For the first 28 days, a sunflower grows at a rate of 3.5 cm per day.
 - II. The value of a car depreciates at a rate of 15% per year after it is purchased.
 - III. The amount of bacteria in a culture triples every two days during an experiment.
- Which of the statements describes a situation with an equal difference over an equal interval?

- 97 The table below shows the temperature, $T(m)$, of a cup of hot chocolate that is allowed to chill over several minutes, m .

| Time, m (minutes) | 0 | 2 | 4 | 6 | 8 |
|--|-----|-----|----|----|----|
| Temperature, $T(m)$ ($^{\circ}\text{F}$) | 150 | 108 | 78 | 56 | 41 |

Which expression best fits the data for $T(m)$?

- 98 Which function is shown in the table below?

| x | $f(x)$ |
|-----|---------------|
| -2 | $\frac{1}{9}$ |
| -1 | $\frac{1}{3}$ |
| 0 | 1 |
| 1 | 3 |
| 2 | 9 |
| 3 | 27 |

- 99 An equation is given below.

$$4(x - 7) = 0.3(x + 2) + 2.11$$

The solution to the equation is

- 102 The country of Benin in West Africa has a population of 9.05 million people. The population is growing at a rate of 3.1% each year. Which function can be used to find the population 7 years from now?

- 100 The highest possible grade for a book report is 100. The teacher deducts 10 points for each day the report is late. Which kind of function describes this situation?

- 103 What are the roots of the equation $x^2 + 4x - 16 = 0$?

- 101 What is the *minimum* value of the function $y = |x + 3| - 2$?

- 104 What are the zeros of the function $f(x) = x^2 - 13x - 30$?

105 The table below represents the function F .

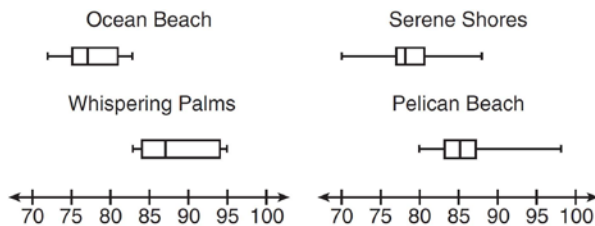
| | | | | | |
|--------|---|----|----|-----|-----|
| x | 3 | 4 | 6 | 7 | 8 |
| $F(x)$ | 9 | 17 | 65 | 129 | 257 |

The equation that represents this function is

106 If $f(1) = 3$ and $f(n) = -2f(n - 1) + 1$, then $f(5) =$

107 The expression $49x^2 - 36$ is equivalent to

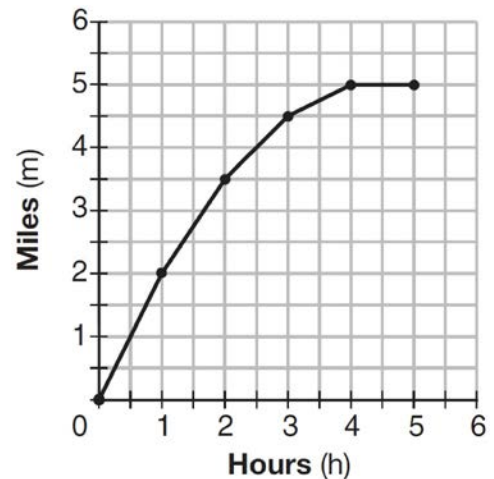
108 Corinne is planning a beach vacation in July and is analyzing the daily high temperatures for her potential destination. She would like to choose a destination with a high median temperature and a small interquartile range. She constructed box plots shown in the diagram below.



Which destination has a median temperature above 80 degrees and the smallest interquartile range?

109 When solving the equation $4(3x^2 + 2) - 9 = 8x^2 + 7$, Emily wrote $4(3x^2 + 2) = 8x^2 + 16$ as her first step. Which property justifies Emily's first step?

110 The graph below shows the distance in miles, m , hiked from a camp in h hours.



Which hourly interval had the greatest rate of change?

111 When directed to solve a quadratic equation by completing the square, Sam arrived at the equation $\left(x - \frac{5}{2}\right)^2 = \frac{13}{4}$. Which equation could have been the original equation given to Sam?

- 112 A parking garage charges a base rate of \$3.50 for up to 2 hours, and an hourly rate for each additional hour. The sign below gives the prices for up to 5 hours of parking.

| Parking Rates | |
|---------------|---------|
| 2 hours | \$3.50 |
| 3 hours | \$9.00 |
| 4 hours | \$14.50 |
| 5 hours | \$20.00 |

Which linear equation can be used to find x , the additional hourly parking rate?

- 113 What is the solution to the inequality

$$2 + \frac{4}{9}x \geq 4 + x?$$

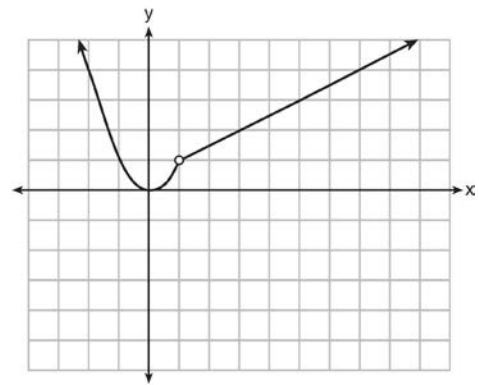
- 114 Abigail's and Gina's ages are consecutive integers. Abigail is younger than Gina and Gina's age is represented by x . If the difference of the square of Gina's age and eight times Abigail's age is 17, which equation could be used to find Gina's age?

- 115 The cost of a pack of chewing gum in a vending machine is \$0.75. The cost of a bottle of juice in the same machine is \$1.25. Julia has \$22.00 to spend on chewing gum and bottles of juice for her team and she must buy seven packs of chewing gum. If b represents the number of bottles of juice, which inequality represents the maximum number of bottles she can buy?

- 116 What are the solutions to the equation

$$3x^2 + 10x = 8?$$

- 117 A function is graphed on the set of axes below.



Which function is related to the graph?

- 118 Keith determines the zeros of the function $f(x)$ to be -6 and 5 . What could be Keith's function?

- 119 Which expression is equivalent to $16x^2 - 36$?

- 120 The zeros of the function $f(x) = 3x^2 - 3x - 6$ are

- 121 The table below shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited.

| Year | Balance, in Dollars |
|------|---------------------|
| 0 | 380.00 |
| 10 | 562.49 |
| 20 | 832.63 |
| 30 | 1232.49 |
| 40 | 1824.39 |
| 50 | 2700.54 |

Which type of function best models the given data?

- 122 The zeros of the function $f(x) = 2x^2 - 4x - 6$ are
- 123 Which expression is equivalent to $36x^2 - 100$?
- 124 If a population of 100 cells triples every hour, which function represents $p(t)$, the population after t hours?
- 125 Mo's farm stand sold a total of 165 pounds of apples and peaches. She sold apples for \$1.75 per pound and peaches for \$2.50 per pound. If she made \$337.50, how many pounds of peaches did she sell?
- 126 Which expression is equivalent to $2(3g - 4) - (8g + 3)$?
- 127 What is the domain of the relation shown below?
 $\{(4, 2), (1, 1), (0, 0), (1, -1), (4, -2)\}$
- 128 In a sequence, the first term is 4 and the common difference is 3. The fifth term of this sequence is
- 129 Which recursively defined function has a first term equal to 10 and a common difference of 4?
- 130 What is the solution of the equation $2(x + 2)^2 - 4 = 28$?
- 131 The formula for the volume of a cone is $V = \frac{1}{3}\pi r^2 h$. The radius, r , of the cone may be expressed as

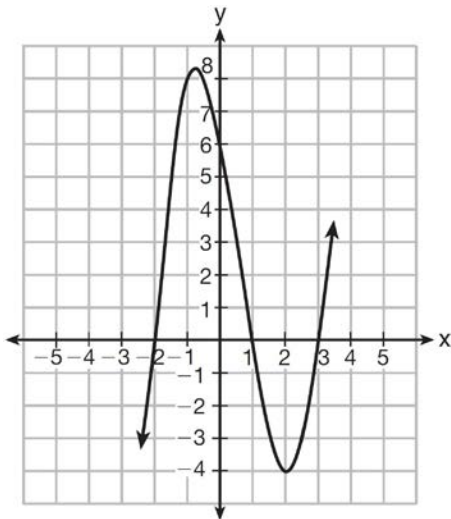
132 If $A = 3x^2 + 5x - 6$ and $B = -2x^2 - 6x + 7$, then $A - B$ equals

133 Which equation(s) represent the graph below?

I $y = (x + 2)(x^2 - 4x - 12)$

II $y = (x - 3)(x^2 + x - 2)$

III $y = (x - 1)(x^2 - 5x - 6)$



134 What is the solution to the system of equations below?

$$y = 2x + 8$$

$$3(-2x + y) = 12$$

135 What is the solution set of the equation $(x - 2)(x - a) = 0$?

136 What is the product of $2x + 3$ and $4x^2 - 5x + 6$?

137 The equation $A = 1300(1.02)^7$ is being used to calculate the amount of money in a savings account. What does 1.02 represent in this equation?

138 Which value of x satisfies the equation

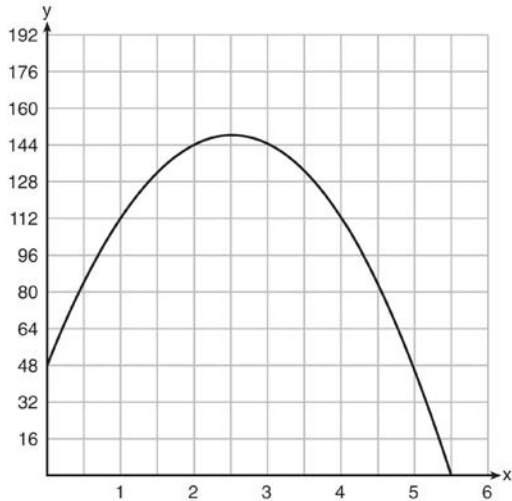
$$\frac{5}{6} \left(\frac{3}{8} - x \right) = 16?$$

139 Alicia has invented a new app for smart phones that two companies are interested in purchasing for a 2-year contract. Company A is offering her \$10,000 for the first month and will increase the amount each month by \$500. Company B is offering \$500 for the first month and will double their payment each month from the previous month. Monthly payments are made at the end of each month. For which monthly payment will company B 's payment first exceed company A 's payment?

140 When $(2x - 3)^2$ is subtracted from $5x^2$, the result is

141 The third term in an arithmetic sequence is 10 and the fifth term is 26. If the first term is a_1 , which is an equation for the n th term of this sequence?

- 142 A ball is thrown into the air from the edge of a 48-foot-high cliff so that it eventually lands on the ground. The graph below shows the height, y , of the ball from the ground after x seconds.



For which interval is the ball's height always *decreasing*?

- 143 Boyle's Law involves the pressure and volume of gas in a container. It can be represented by the formula $P_1 V_1 = P_2 V_2$. When the formula is solved for P_2 , the result is
- 144 Lynn, Jude, and Anne were given the function $f(x) = -2x^2 + 32$, and they were asked to find $f(3)$. Lynn's answer was 14, Jude's answer was 4, and Anne's answer was ± 4 . Who is correct?
- 145 Which equation and ordered pair represent the correct vertex form and vertex for $j(x) = x^2 - 12x + 7$?

- 146 Peyton is a sprinter who can run the 40-yard dash in 4.5 seconds. He converts his speed into miles per hour, as shown below.

$$\frac{40 \text{ yd}}{4.5 \text{ sec}} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}}$$

Which ratio is *incorrectly* written to convert his speed?

- 147 To watch a varsity basketball game, spectators must buy a ticket at the door. The cost of an adult ticket is \$3.00 and the cost of a student ticket is \$1.50. If the number of adult tickets sold is represented by a and student tickets sold by s , which expression represents the amount of money collected at the door from the ticket sales?
- 148 What is the value of x in the equation $\frac{x-2}{3} + \frac{1}{6} = \frac{5}{6}$?
- 149 Officials in a town use a function, C , to analyze traffic patterns. $C(n)$ represents the rate of traffic through an intersection where n is the number of observed vehicles in a specified time interval. What would be the most appropriate domain for the function?
- 150 The daily cost of production in a factory is calculated using $c(x) = 200 + 16x$, where x is the number of complete products manufactured. Which set of numbers best defines the domain of $c(x)$?

151 Which polynomial function has zeros at -3, 0, and 4?

152 A sunflower is 3 inches tall at week 0 and grows 2 inches each week. Which function(s) shown below can be used to determine the height, $f(n)$, of the sunflower in n weeks?

- I. $f(n) = 2n + 3$
- II. $f(n) = 2n + 3(n - 1)$
- III. $f(n) = f(n - 1) + 2$ where $f(0) = 3$

153 Last week, a candle store received \$355.60 for selling 20 candles. Small candles sell for \$10.98 and large candles sell for \$27.98. How many large candles did the store sell?

154 Given the function $f(n)$ defined by the following:

$$f(1) = 2$$

$$f(n) = -5f(n - 1) + 2$$

Which set could represent the range of the function?

155 Four expressions are shown below.

I $2(2x^2 - 2x - 60)$

II $4(x^2 - x - 30)$

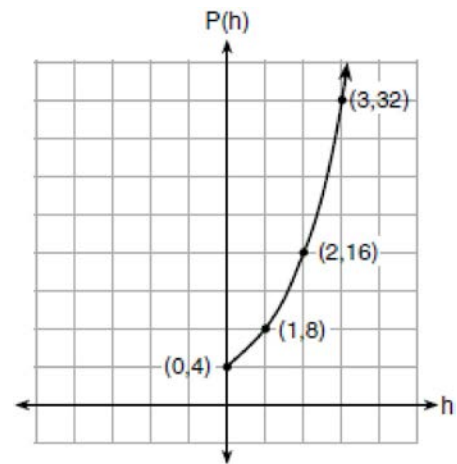
III $4(x + 6)(x - 5)$

IV $4x(x - 1) - 120$

The expression $4x^2 - 4x - 120$ is equivalent to

156 The range of the function defined as $y = 5^x$ is

157 Vinny collects population data, $P(h)$, about a specific strain of bacteria over time in hours, h , as shown in the graph below.



Which equation represents the graph of $P(h)$?

158 Kendal bought x boxes of cookies to bring to a party. Each box contains 12 cookies. She decides to keep two boxes for herself. She brings 60 cookies to the party. Which equation can be used to find the number of boxes, x , Kendal bought?

159 Morgan throws a ball up into the air. The height of the ball above the ground, in feet, is modeled by the function $h(t) = -16t^2 + 24t$, where t represents the time, in seconds, since the ball was thrown. What is the appropriate domain for this situation?

160 Which value of x satisfies the equation

$$\frac{7}{3} \left(x + \frac{9}{28} \right) = 20?$$

161 The tables below show the values of four different functions for given values of x .

| x | $f(x)$ | x | $g(x)$ | x | $h(x)$ | x | $k(x)$ |
|-----|--------|-----|--------|-----|--------|-----|--------|
| 1 | 12 | 1 | -1 | 1 | 9 | 1 | -2 |
| 2 | 19 | 2 | 1 | 2 | 12 | 2 | 4 |
| 3 | 26 | 3 | 5 | 3 | 17 | 3 | 14 |
| 4 | 33 | 4 | 13 | 4 | 24 | 4 | 28 |

Which table represents a linear function?

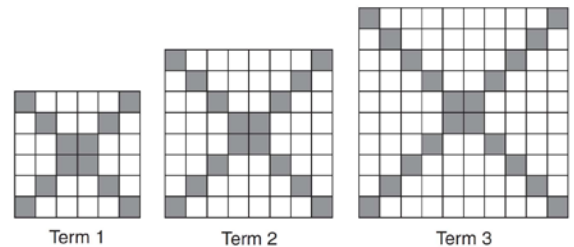
162 The Celluloid Cinema sold 150 tickets to a movie. Some of these were child tickets and the rest were adult tickets. A child ticket cost \$7.75 and an adult ticket cost \$10.25. If the cinema sold \$1470 worth of tickets, which system of equations could be used to determine how many adult tickets, a , and how many child tickets, c , were sold?

163 A car leaves Albany, NY, and travels west toward Buffalo, NY. The equation $D = 280 - 59t$ can be used to represent the distance, D , from Buffalo after t hours. In this equation, the 59 represents the

164 Joe has a rectangular patio that measures 10 feet by 12 feet. He wants to increase the area by 50% and plans to increase each dimension by equal lengths, x . Which equation could be used to determine x ?

165 Which recursively defined function represents the sequence 3, 7, 15, 31, ...?

166 The diagrams below represent the first three terms of a sequence.



Assuming the pattern continues, which formula determines a_n , the number of shaded squares in the n th term?

167 What are the solutions to the equation $x^2 - 8x = 10$?

168 An online company lets you download songs for \$0.99 each after you have paid a \$5 membership fee. Which domain would be most appropriate to calculate the cost to download songs?

169 When $3x + 2 \leq 5(x - 4)$ is solved for x , the solution is

170 Let f be a function such that $f(x) = 2x - 4$ is defined on the domain $2 \leq x \leq 6$. The range of this function is

171 The range of the function $f(x) = x^2 + 2x - 8$ is all real numbers

172 The zeros of the function $f(x) = (x + 2)^2 - 25$ are

Algebra I Common Core State Standards Regents Bimodal Worksheets Answer Section

1 ANS:

$$c = 60 + 0.05d$$

PTS: 2

REF: 061422ai

TOP: Modeling Linear Equations

2 ANS:

III, only

PTS: 2

REF: 061516ai

TOP: Analysis of Data

3 ANS:

27

$$f(8) = \frac{1}{2}(8)^2 - \left(\frac{1}{4}(8) + 3 \right) = 32 - 5 = 27$$

PTS: 2

REF: 081704ai

TOP: Functional Notation

4 ANS:

-1

$$\frac{\sqrt{2\left(\frac{1}{2}\right) + 3}}{6\left(\frac{1}{2}\right) - 5} = \frac{\sqrt{4}}{-2} = \frac{2}{-2} = -1$$

PTS: 2

REF: 081512ai

TOP: Functional Notation

5 ANS:

$$\frac{120 \text{ ft}^3}{1} \cdot \frac{1 \text{ load}}{8 \text{ ft}^3} \cdot \frac{10 \text{ min}}{1 \text{ load}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$$

PTS: 2

REF: 061720ai

TOP: Conversions KEY: dimensional analysis

6 ANS:

II and IV

PTS: 2

REF: 081511ai

TOP: Defining Functions

KEY: mixed

7 ANS:

2

$$|x + 2| = 3x - 2$$

$$x + 2 = 3x - 2$$

$$4 = 2x$$

$$x = 2$$

PTS: 2

REF: 081702ai

TOP: Other Systems

KEY: AI

8 ANS:

It decreases 22% per year.

PTS: 2

REF: 081624ai

TOP: Modeling Exponential Functions

9 ANS:

$$P(x) = -0.5x^2 + 500x - 350$$

$$P(x) = -0.5x^2 + 800x - 100 - (300x + 250) = -0.5x^2 + 500x - 350$$

PTS: 2

REF: 081406ai

TOP: Operations with Functions

10 ANS:

$$4.50 + 0.79r \leq 16.00; 14 \text{ rides}$$

PTS: 2

REF: 011513ai

TOP: Modeling Linear Inequalities

11 ANS:

$$m + g \leq 40$$

$$12m + 14g \geq 250$$

PTS: 2

REF: 061711ai

TOP: Modeling Systems of Linear Inequalities

12 ANS:

$$P(x) = (x + 1)(x - 2)^2$$

PTS: 2

REF: 081707ai

TOP: Zeros of Polynomials

KEY: AI

13 ANS:

$$t = \sqrt{\frac{2d}{a}}$$

$$d = \frac{1}{2}at^2$$

$$2d = at^2$$

$$\frac{2d}{a} = t^2$$

$$\sqrt{\frac{2d}{a}} = t$$

PTS: 2

REF: 061519ai

TOP: Transforming Formulas

14 ANS:

$$r = \sqrt{\frac{V}{\pi h}}$$

PTS: 2

REF: 011516ai

TOP: Transforming Formulas

15 ANS:

-1.75 and 4

$$x^2 - 2x - 8 = \frac{1}{4}x - 1$$

$$4x^2 - 8x - 32 = x - 4$$

$$4x^2 - 9x - 28 = 0$$

$$(4x + 7)(x - 4) = 0$$

$$x = -\frac{7}{4}, 4$$

PTS: 2

REF: 081517ai

TOP: Quadratic-Linear Systems

KEY: AI

16 ANS:

$$y = 14.1x + 5.8$$

PTS: 2

REF: 081421ai

TOP: Regression KEY: linear

17 ANS:

28%

$$\frac{14}{16 + 20 + 14} = 28\%$$

PTS: 2

REF: 011705ai

TOP: Frequency Tables

KEY: two-way

18 ANS:

$$m + f = 3.95$$

$$f + 0.005 = m$$

PTS: 2

REF: 081419ai

TOP: Modeling Linear Systems

19 ANS:

$$3 \pm 2\sqrt{7}$$

$$x^2 - 6x = 19$$

$$x^2 - 6x + 9 = 19 + 9$$

$$(x - 3)^2 = 28$$

$$x - 3 = \pm\sqrt{4 \cdot 7}$$

$$x = 3 \pm 2\sqrt{7}$$

PTS: 2

REF: fall1302ai

TOP: Solving Quadratics

KEY: quadratic formula

20 ANS:

$$750 < p < 1500$$

$$\frac{750 + 2.25p}{p} > 2.75 \quad \frac{750 + 2.25p}{p} < 3.25$$

$$750 + 2.25p > 2.75p \quad 750 + 2.25p < 3.25p$$

$$750 > .50p \quad 750 < p$$

$$1500 > p$$

PTS: 2

REF: 061524ai

TOP: Modeling Linear Inequalities

21 ANS:

$$a_1 = 49; a_n = a_{n-1} + 21$$

PTS: 2

REF: 011708ai

TOP: Sequences

22 ANS:

$$-0.04$$

$$\frac{4.7 - 2.3}{20 - 80} = \frac{2.4}{-60} = -0.04.$$

PTS: 2

REF: 081414ai

TOP: Rate of Change

KEY: AI

23 ANS:

$$3x - 1 = \pm 5$$

PTS: 2

REF: 061521ai

TOP: Solving Quadratics

KEY: taking square roots

24 ANS:

$$4$$

$$16^{2t} = n^{4t}$$

$$(16^2)^t = (n^4)^t$$

$$((4^2)^2)^t = ((n^2)^2)^t$$

PTS: 2

REF: 011519ai

TOP: Modeling Exponential Functions

KEY: AI

25 ANS:

$$2x^2 + 7x - 13$$

$$3(x^2 - 1) - (x^2 - 7x + 10)$$

$$3x^2 - 3 - x^2 + 7x - 10$$

$$2x^2 + 7x - 13$$

PTS: 2

REF: 061610ai

TOP: Operations with Polynomials

KEY: subtraction

26 ANS:

$$\{0, 2, 3\}$$

$$2x^3 + 12x - 10x^2 = 0$$

$$2x(x^2 - 5x + 6) = 0$$

$$2x(x - 3)(x - 2) = 0$$

$$x = 0, 2, 3$$

PTS: 2

REF: 081719ai

TOP: Zeros of Polynomials

27 ANS:

$$6x^2 - 28x + 30$$

PTS: 2

REF: 011510ai

TOP: Operations with Polynomials

KEY: multiplication

28 ANS:

$$x^2 + 8^2 = (x + 2)^2$$

PTS: 2

REF: spr1304ai

TOP: Geometric Applications of Quadratics

29 ANS:

$$h < 14$$

$$2h + 8 > 3h - 6$$

$$14 > h$$

$$h < 14$$

PTS: 2

REF: 081607ai

TOP: Solving Linear Inequalities

30 ANS:

the amount spent to manufacture each radio

PTS: 2

REF: 061407ai

TOP: Modeling Linear Functions

31 ANS:

$$2lw$$

PTS: 2

REF: 061702ai

TOP: Dependent and Independent Variables

32 ANS:

$$c(z) = 0.20(z - 1) + 0.46$$

PTS: 2

REF: 011523ai

TOP: Modeling Linear Functions

33 ANS:

$$-3 \pm \sqrt{7}$$

PTS: 2

REF: 081523ai

TOP: Solving Quadratics

KEY: taking square roots

34 ANS:

-1 and 6

$$f(x) = x^2 - 5x - 6 = (x + 1)(x - 6) = 0$$

$$x = -1, 6$$

PTS: 2

REF: 061612ai

TOP: Zeros of Polynomials

KEY: AI

35 ANS:

$$x > 9$$

$$7 - \frac{2}{3}x < x - 8$$

$$15 < \frac{5}{3}x$$

$$9 < x$$

PTS: 2

REF: 011507ai

TOP: Solving Linear Inequalities

36 ANS:

II, only

PTS: 2

REF: 011604ai

TOP: Operations with Radicals

KEY: classify

37 ANS:

3

$$m = \frac{3 - -7}{2 - 4} = -5 \quad 3 = (-5)(2) + b \quad y = -5x + 13 \text{ represents the line passing through the points } (2, 3) \text{ and } (4, -7). \text{ The}$$

$$b = 13$$

fourth equation may be rewritten as $y = 5x - 13$, so is a different line.

PTS: 2

REF: 081720ai

TOP: Writing Linear Equations

KEY: other forms

38 ANS:

$$f(x) = (x + 2)(x^2 + 3x - 4)$$

$$f(x) = (x + 2)(x + 4)(x - 1)$$

PTS: 2

REF: 081504ai

TOP: Zeros of Polynomials

KEY: AI

39 ANS:

II and III

PTS: 2

REF: 061522ai

TOP: Sequences

40 ANS:

$$-\frac{5}{6}$$

$$36x^2 = 25$$

$$x^2 = \frac{25}{36}$$

$$x = \pm \frac{5}{6}$$

PTS: 2 REF: 011715ai TOP: Solving Quadratics

KEY: taking square roots

41 ANS:

$$f(x) = -4x - 2$$

PTS: 2 REF: 081610ai TOP: Sequences

42 ANS:

1.7%

PTS: 2 REF: 061517ai TOP: Modeling Exponential Functions

43 ANS:

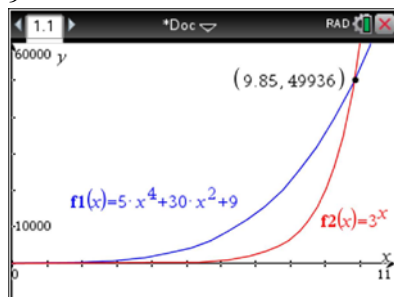
0.2083 minute

$$12.5 \text{ sec} \times \frac{1 \text{ min}}{60 \text{ sec}} = 0.208\bar{3} \text{ min}$$

PTS: 2 REF: 061608ai TOP: Conversions KEY: dimensional analysis

44 ANS:

9



PTS: 2 REF: 061621ai TOP: Families of Functions

45 ANS:

$$280 - 30(w - 1)$$

PTS: 2 REF: 011718ai TOP: Modeling Expressions

46 ANS:

5000, the amount of money in the account initially

PTS: 2 REF: 011515ai TOP: Modeling Exponential Functions

47 ANS:

 $h(x)$, $f(x)$, $g(x)$

Over the interval $0 \leq x \leq 3$, the average rate of change for $h(x) = \frac{9-2}{3-0} = \frac{7}{3}$, $f(x) = \frac{7-1}{3-0} = \frac{6}{3} = 2$, and

$$g(x) = \frac{3-0}{3-0} = \frac{3}{3} = 1.$$

PTS: 2 REF: spr1301ai TOP: Rate of Change

KEY: AI

48 ANS:

I, only

PTS: 2 REF: 011524ai TOP: Zeros of Polynomials

KEY: AI

49 ANS:

-5 and 5

PTS: 2 REF: 081403ai TOP: Solving Quadratics

KEY: taking square roots

50 ANS:

10

$$4x - 5(0) = 40$$

$$4x = 40$$

$$x = 10$$

PTS: 2 REF: 081408ai TOP: Graphing Linear Functions

51 ANS:

$$3x^2 - 14x + 14$$

$$3(x^2 - 4x + 4) - 2x + 2 = 3x^2 - 12x + 12 - 2x + 2 = 3x^2 - 14x + 14$$

PTS: 2 REF: 081524ai TOP: Operations with Polynomials

KEY: multiplication

52 ANS:

$$C = 62 + 30(g - 2)$$

PTS: 2 REF: 081508ai TOP: Modeling Linear Equations

53 ANS:

$$f(x) = 3(x + 2)^2 - 1$$

$$3(x^2 + 4x + 4) - 12 + 11$$

$$3(x + 2)^2 - 1$$

PTS: 2 REF: 081621ai TOP: Vertex Form of a Quadratic

54 ANS:

$$\{x|x \geq -4\}$$

PTS: 2

REF: 061509ai

TOP: Domain and Range

KEY: graph

55 ANS:

distributive property of multiplication over subtraction

PTS: 2

REF: 081701ai

TOP: Identifying Properties

56 ANS:

$$y = x^2 + 10x + 24$$

$$(x + 4)(x + 6) = 0$$

$$x^2 + 10x + 24 = 0$$

PTS: 2

REF: spr1303ai

TOP: Zeros of Polynomials

KEY: AI

57 ANS:

28

1, 3, 6, 10, 15, 21, 28, ...

PTS: 2

REF: 081715ai

TOP: Sequences

KEY: term

58 ANS:

$$q(x) = -\frac{1}{2}(x - 15)^2 + 25$$

Vertex (15,25), point (10,12.5) $12.5 = a(10 - 15)^2 + 25$

$$-12.5 = 25a$$

$$-\frac{1}{2} = a$$

PTS: 2

REF: 061716ai

TOP: Graphing Quadratic Functions

KEY: no context

59 ANS:

$$f(t) = 25^{t+1}$$

PTS: 2

REF: 061513ai

TOP: Families of Functions

60 ANS:

$$(p^2 + 9)(p + 3)(p - 3)$$

PTS: 2

REF: 011522ai

TOP: Factoring the Difference of Perfect Squares

KEY: higher power AI

61 ANS:

up

PTS: 2

REF: 081501ai

TOP: Graphing Linear Functions

62 ANS:
 $y \geq 2x - 3$

PTS: 2 REF: 011605ai TOP: Graphing Linear Inequalities

63 ANS:
 $x = 4 \pm 2\sqrt{10}$
 $x^2 - 8x + 16 = 24 + 16$
 $(x - 4)^2 = 40$
 $x - 4 = \pm\sqrt{40}$
 $x = 4 \pm 2\sqrt{10}$

PTS: 2 REF: 061523ai TOP: Solving Quadratics
 KEY: completing the square

64 ANS:
 $0 \leq t \leq 3$
 $0 = -16t^2 + 144$
 $16t^2 = 144$
 $t^2 = 9$
 $t = 3$

PTS: 2 REF: 081423ai TOP: Domain and Range

65 ANS:
 $3000(1 + 0.02)^{16}$

PTS: 2 REF: 011504ai TOP: Modeling Exponential Functions
 KEY: AI

66 ANS:
 17.06
 $119.67(0.61)^5 - 119.67(0.61)^3 \approx 17.06$

PTS: 2 REF: 011603ai TOP: Evaluating Functions

67 ANS:
 quadratic

PTS: 2 REF: 061624ai TOP: Families of Functions

68 ANS:
 5.4
 $\frac{36.6 - 15}{4 - 0} = \frac{21.6}{4} = 5.4$

PTS: 2 REF: 061511ai TOP: Rate of Change
 KEY: AI

- 69 ANS:
 $x(x+2)(x-15)$
- PTS: 2 REF: 011612ai TOP: Factoring Polynomials
 KEY: higher power AI
- 70 ANS:
 $\frac{I}{Pt}$
- PTS: 2 REF: 011606ai TOP: Transforming Formulas
- 71 ANS:
 $j^2 + 2j = 783$
- PTS: 2 REF: 081409ai TOP: Modeling Quadratics
- 72 ANS:
 I, II, and III
- PTS: 2 REF: 081709ai TOP: Modeling Linear Functions
- 73 ANS:
 $A = 1000(1 + 0.013)^2$
- PTS: 2 REF: 061712ai TOP: Modeling Exponential Functions
 KEY: AI
- 74 ANS:
 12
 $\frac{0.8(10^2) - 0.8(5^2)}{10 - 5} = \frac{80 - 20}{5} = 12$
- PTS: 2 REF: 011521ai TOP: Rate of Change
 KEY: AI
- 75 ANS:
 $0.05(x + 4) + 0.10(x) = \1.25
- PTS: 2 REF: 061416ai TOP: Modeling Linear Equations
- 76 ANS:
 2
- PTS: 2 REF: 011601ai TOP: Vertex Form of a Quadratic
- 77 ANS:
 $(x+3)(x-2)(x-4)$
- PTS: 2 REF: 081623ai TOP: Zeros of Polynomials
 KEY: AI
- 78 ANS:
 A
- PTS: 2 REF: 061420ai TOP: Functional Notation

79 ANS:

$$(x^2 - 6)(x^2 - 6)$$

PTS: 2

REF: 081415ai

TOP: Factoring Polynomials

KEY: higher power AI

80 ANS:

5

$$f(0+1) = -2f(0) + 3 = -2(2) + 3 = -1$$

$$f(1+1) = -2f(1) + 3 = -2(-1) + 3 = 5$$

PTS: 2

REF: 011520ai

TOP: Sequences

KEY: term

81 ANS:

nonnegative rational numbers

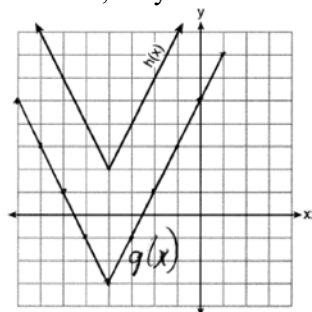
PTS: 2

REF: 061623ai

TOP: Domain and Range

82 ANS:

I and III, only



PTS: 2

REF: 081718ai

TOP: Comparing Functions

83 ANS:

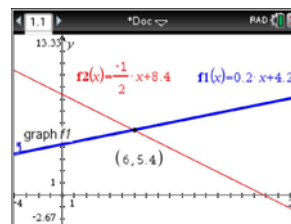
positive integers

PTS: 2

REF: 011615ai

TOP: Domain and Range

84 ANS:
(6.0,5.4)



$$m = \frac{5 - 4.6}{4 - 2} = \frac{.4}{2} = 0.2 \quad 4(0.2x + 4.2) + 2x = 33.6 \quad y = 0.2(6) + 4.2 = 5.4$$

$$5 = 2(4) + b \quad 0.8x + 16.8 + 2x = 33.6$$

$$4.2 = b \quad 2.8x = 16.8$$

$$y = 0.2x + 4.2 \quad x = 6$$

PTS: 2 REF: 061618ai TOP: Solving Linear Systems

KEY: substitution

85 ANS:
2589

$$25,000(0.86)^2 - 25,000(0.86)^3 = 18490 - 15901.40 = 2588.60$$

PTS: 2 REF: 011508ai TOP: Functional Notation

86 ANS:
-0.93

PTS: 2 REF: 061411ai TOP: Correlation Coefficient

87 ANS:
-2

$$\frac{1}{2}x + 3 = |x| \quad -\frac{1}{2}x - 3 = x$$

$$\frac{1}{2}x + 3 = x \quad -x - 6 = 2x$$

$$-6 = 3x$$

$$x + 6 = 2x \quad -2 = x$$

$$6 = x$$

PTS: 2 REF: 011617ai TOP: Other Systems

KEY: AI

88 ANS:

20° Celsius

$$C(68) = \frac{5}{9}(68 - 32) = 20$$

PTS: 2 REF: 011710ai TOP: Conversions KEY: formula

89 ANS:
5b

PTS: 2 REF: 081712ai TOP: Modeling Expressions

90 ANS:
60

$$\frac{30}{30+12+8} = 0.6$$

PTS: 2

REF: 061615ai

TOP: Frequency Tables

KEY: two-way

91 ANS:
6

$$x^2 - 12x + 7$$

$$x^2 - 12x + 36 - 29$$

$$(x-6)^2 - 29$$

PTS: 2

REF: 081520ai

TOP: Vertex Form of a Quadratic

92 ANS:

$$(x^2 - 3y)(x^2 + 3y)$$

PTS: 2

REF: 061503ai

TOP: Factoring the Difference of Perfect Squares

KEY: multivariable AI

93 ANS:

hours worked per week

PTS: 2

REF: 011501ai

TOP: Modeling Linear Functions

94 ANS:

whole numbers

PTS: 2

REF: 011506ai

TOP: Domain and Range

95 ANS:

$$y \geq -3x + 4$$

PTS: 2

REF: 061505ai

TOP: Graphing Linear Inequalities

96 ANS:

I, only

PTS: 2

REF: 011623ai

TOP: Families of Functions

97 ANS:

$$150(0.85)^m$$

PTS: 2

REF: 081617ai

TOP: Modeling Exponential Functions

KEY: AI

98 ANS:

$$f(x) = 3^x$$

PTS: 2

REF: 011616ai

TOP: Families of Functions

99 ANS:

8.3

$$4(x - 7) = 0.3(x + 2) + 2.11$$

$$4x - 28 = 0.3x + 0.6 + 2.11$$

$$3.7x - 28 = 2.71$$

$$3.7x = 30.71$$

$$x = 8.3$$

PTS: 2

REF: 061719ai

TOP: Solving Linear Equations

KEY: decimals

100 ANS:

linear

PTS: 2

REF: 081717ai

TOP: Families of Functions

101 ANS:

-2

PTS: 2

REF: 011712ai

TOP: Graphing Absolute Value Functions

102 ANS:

$$f(t) = (9.05 \times 10^6)(1 + 0.031)^7$$

PTS: 2

REF: 081507ai

TOP: Modeling Exponential Functions

KEY: AI

103 ANS:

$$-2 \pm 2\sqrt{5}$$

$$x^2 + 4x = 16$$

$$x^2 + 4x + 4 = 16 + 4$$

$$(x + 2)^2 = 20$$

$$x + 2 = \pm\sqrt{4 \cdot 5}$$

$$= -2 \pm 2\sqrt{5}$$

PTS: 2

REF: 061410ai

TOP: Solving Quadratics

KEY: completing the square

104 ANS:

15 and -2

$$x^2 - 13x - 30 = 0$$

$$(x - 15)(x + 2) = 0$$

$$x = 15, -2$$

PTS: 2

REF: 061510ai

TOP: Zeros of Polynomials

KEY: AI

105 ANS:

$$F(x) = 2^x + 1$$

PTS: 2 REF: 061415ai TOP: Families of Functions

106 ANS:

43

$$f(1) = 3; f(2) = -5; f(3) = 11; f(4) = -21; f(5) = 43$$

PTS: 2 REF: 081424ai TOP: Sequences KEY: term

107 ANS:

$$(7x - 6)(7x + 6)$$

PTS: 2 REF: 081703ai TOP: Factoring the Difference of Perfect Squares

KEY: quadratic

108 ANS:

Pelican Beach

PTS: 2 REF: 011514ai TOP: Central Tendency and Dispersion

109 ANS:

addition property of equality

PTS: 2 REF: 061401ai TOP: Identifying Properties

110 ANS:

hour 0 to hour 1

The graph is steepest between hour 0 and hour 1.

PTS: 2 REF: 081601ai TOP: Rate of Change

KEY: AI

111 ANS:

$$x^2 - 5x + 3 = 0$$

$$x^2 - 5x = -3$$

$$x^2 - 5x + \frac{25}{4} = \frac{-12}{4} + \frac{25}{4}$$

$$\left(x - \frac{5}{2}\right)^2 = \frac{13}{4}$$

PTS: 2 REF: 061518ai TOP: Solving Quadratics

KEY: completing the square

112 ANS:

$$2x + 3.50 = 14.50$$

PTS: 2 REF: 081614ai TOP: Modeling Linear Equations

113 ANS:

$$x \leq -\frac{18}{5}$$

$$2 + \frac{4}{9}x \geq 4 + x$$

$$-2 \geq \frac{5}{9}x$$

$$x \leq -\frac{18}{5}$$

PTS: 2

REF: 081711ai

TOP: Solving Linear Inequalities

114 ANS:

$$x^2 - 8(x - 1) = 17$$

PTS: 2

REF: 081723ai

TOP: Modeling Quadratics

115 ANS:

$$0.75(7) + 1.25b \leq 22$$

PTS: 2

REF: 081505ai

TOP: Modeling Linear Inequalities

116 ANS:

$$\frac{2}{3} \text{ and } -4$$

$$3x^2 + 10x - 8 = 0$$

$$(3x - 2)(x + 4) = 0$$

$$x = \frac{2}{3}, -4$$

PTS: 2

REF: 081619ai

TOP: Solving Quadratics

KEY: factoring

117 ANS:

$$f(x) = \begin{cases} x^2, & x < 1 \\ \frac{1}{2}x + \frac{1}{2}, & x > 1 \end{cases}$$

PTS: 2

REF: 081422ai

TOP: Graphing Piecewise-Defined Functions

118 ANS:

$$f(x) = (x - 5)(x + 6)$$

PTS: 2

REF: 061412ai

TOP: Solving Quadratics

- 119 ANS:
 $4(2x + 3)(2x - 3)$
 $16x^2 - 36 = 4(2x + 3)(2x - 3)$
- PTS: 2 REF: 011701ai TOP: Factoring the Difference of Perfect Squares
 KEY: quadratic
- 120 ANS:
 -1 and 2
 $3x^2 - 3x - 6 = 0$
 $3(x^2 - x - 2) = 0$
 $3(x - 2)(x + 1) = 0$
 $x = 2, -1$
- PTS: 2 REF: 081513ai TOP: Solving Quadratics
- 121 ANS:
 exponential growth function
- PTS: 2 REF: 061406ai TOP: Families of Functions
- 122 ANS:
 3 and -1
 $2x^2 - 4x - 6 = 0$
 $2(x^2 - 2x - 3) = 0$
 $2(x - 3)(x + 1) = 0$
 $x = 3, -1$
- PTS: 2 REF: 011609ai TOP: Solving Quadratics
- 123 ANS:
 $4(3x + 5)(3x - 5)$
 $36x^2 - 100 = 4(9x^2 - 25) = 4(3x + 5)(3x - 5)$
- PTS: 2 REF: 081608ai TOP: Factoring the Difference of Perfect Squares
 KEY: quadratic
- 124 ANS:
 $p(t) = 100(3)^t$
- PTS: 2 REF: 081714ai TOP: Families of Functions
 KEY: AI

125 ANS:

65

$$a + p = 165 \quad 1.75(165 - p) + 2.5p = 337.5$$

$$1.75a + 2.5p = 337.5 \quad 288.75 - 1.75p + 2.5p = 337.5$$

$$0.75p = 48.75$$

$$p = 65$$

PTS: 2

REF: 061506ai

TOP: Modeling Linear Systems

126 ANS:

 $-2g - 11$

$$2(3g - 4) - (8g + 3) = 6g - 8 - 8g - 3 = -2g - 11$$

PTS: 2

REF: 011707ai

TOP: Operations with Polynomials

KEY: subtraction

127 ANS:

 $\{0, 1, 4\}$

PTS: 2

REF: 081710ai

TOP: Domain and Range

KEY: limited domain

128 ANS:

16

$$a_n = 3n + 1$$

$$a_5 = 3(5) + 1 = 16$$

PTS: 2

REF: 061613ai

TOP: Sequences

KEY: term

129 ANS:

$$f(1) = 10$$

$$f(x) = f(x - 1) + 4$$

PTS: 2

REF: 081514ai

TOP: Sequences

130 ANS:

2 and -6

$$2(x + 2)^2 = 32$$

$$(x + 2)^2 = 16$$

$$x + 2 = \pm 4$$

$$x = -6, 2$$

PTS: 2

REF: 061619ai

TOP: Solving Quadratics

KEY: taking square roots

131 ANS:

$$\sqrt{\frac{3V}{\pi h}}$$

$$V = \frac{1}{3} \pi r^2 h$$

$$3V = \pi r^2 h$$

$$\frac{3V}{\pi h} = r^2$$

$$\sqrt{\frac{3V}{\pi h}} = r$$

PTS: 2 REF: 061423ai TOP: Transforming Formulas

132 ANS:

$$5x^2 + 11x - 13$$

PTS: 2 REF: 061403ai TOP: Operations with Polynomials

KEY: subtraction

133 ANS:

II, only

$$y = (x - 3)(x + 2)(x - 1)$$

PTS: 2 REF: 061512ai TOP: Zeros of Polynomials

KEY: AI

134 ANS:

no solution

$$3(-2x + 2x + 8) = 12$$

$$24 \neq 12$$

PTS: 2 REF: 061708ai TOP: Solving Linear Systems

KEY: substitution

135 ANS:

2 and a

PTS: 2 REF: 011702ai TOP: Solving Quadratics

136 ANS:

$$8x^3 + 2x^2 - 3x + 18$$

$$(2x + 3)(4x^2 - 5x + 6) = 8x^3 - 10x^2 + 12x + 12x^2 - 15x + 18 = 8x^3 + 2x^2 - 3x + 18$$

PTS: 2 REF: 081612ai TOP: Operations with Polynomials

KEY: multiplication

137 ANS:

2% growth

PTS: 2 REF: 011608ai TOP: Modeling Exponential Functions

138 ANS:

$$-18.825$$

$$6\left(\frac{5}{6}\left(\frac{3}{8}-x\right)=16\right)$$

$$8\left(5\left(\frac{3}{8}-x\right)=96\right)$$

$$15-40x=768$$

$$-40x=753$$

$$x=-18.825$$

PTS: 2

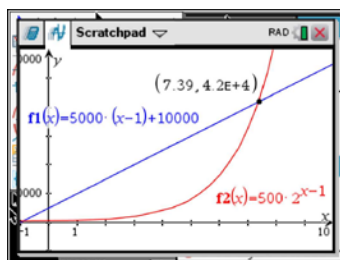
REF: 081713ai

TOP: Solving Linear Equations

KEY: fractional expressions

139 ANS:

8



| x | $A = 5000(x-1) + 10000$ | $B = 500(2)^{x-1}$ |
|---|-------------------------|--------------------|
| 6 | 35,000 | 16,000 |
| 7 | 40,000 | 32,000 |
| 8 | 45,000 | 64,000 |
| 9 | 50,000 | 128,000 |

PTS: 2

REF: 081518ai

TOP: Families of Functions

140 ANS:

$$x^2 + 12x - 9$$

$$5x^2 - (4x^2 - 12x + 9) = x^2 + 12x - 9$$

PTS: 2

REF: 011610ai

TOP: Operations with Polynomials

KEY: multiplication

141 ANS:

$$a_n = 8n - 14$$

PTS: 2

REF: 081416ai

TOP: Sequences

142 ANS:

$$2.5 < x < 5.5$$

PTS: 2

REF: 061409ai

TOP: Graphing Quadratic Functions

KEY: context

143 ANS:

$$\frac{P_1 V_1}{V_2}$$

PTS: 2 REF: 011704ai TOP: Transforming Formulas

144 ANS:

Lynn, only

$$f(3) = -2(3)^2 + 32 = -18 + 32 = 14$$

PTS: 2 REF: 061705ai TOP: Functional Notation

145 ANS:

$$j(x) = (x - 6)^2 - 29, (6, -29)$$

$$j(x) = x^2 - 12x + 36 + 7 - 36$$

$$= (x - 6)^2 - 29$$

PTS: 2 REF: 061616ai TOP: Vertex Form of a Quadratic

146 ANS:

$$\frac{5280 \text{ ft}}{1 \text{ mi}}$$

PTS: 2 REF: 011502ai TOP: Conversions KEY: dimensional analysis

147 ANS:

$$3.00a + 1.50s$$

PTS: 2 REF: 081503ai TOP: Modeling Expressions

148 ANS:

4

$$\frac{x - 2}{3} = \frac{4}{6}$$

$$6x - 12 = 12$$

$$6x = 24$$

$$x = 4$$

PTS: 2 REF: 081420ai TOP: Solving Linear Equations
KEY: fractional expressions

149 ANS:

 $\{0, 1, 2, 3, \dots\}$

There are no negative or fractional cars.

PTS: 2 REF: 061402ai TOP: Domain and Range

150 ANS:

whole numbers

PTS: 2 REF: 011719ai TOP: Domain and Range

- 151 ANS:
 $f(x) = x(x + 3)(x - 4)$
- PTS: 2 REF: 061710ai TOP: Zeros of Polynomials
- 152 ANS:
 I and III
- PTS: 2 REF: 061421ai TOP: Sequences
- 153 ANS:
 8
- $$L + S = 20 \quad 27.98L + 10.98(20 - L) = 355.60$$
- $$27.98L + 10.98S = 355.60 \quad 27.98L + 219.60 - 10.98L = 355.60$$
- $$17L = 136$$
- $$L = 8$$
- PTS: 2 REF: 081510ai TOP: Modeling Linear Systems
- 154 ANS:
 $\{2, -8, 42, -208, \dots\}$
 $f(1) = 2; f(2) = -5(2) + 2 = -8; f(3) = -5(-8) + 2 = 42; f(4) = -5(42) + 2 = -208$
- PTS: 2 REF: 061718ai TOP: Sequences KEY: term
- 155 ANS:
 I, II, and IV
- PTS: 2 REF: 081509ai TOP: Factoring Polynomials
 KEY: quadratic
- 156 ANS:
 $y > 0$
- PTS: 2 REF: 011619ai TOP: Domain and Range
 KEY: real domain, exponential
- 157 ANS:
 $P(h) = 4(2)^h$
- PTS: 2 REF: 061707ai TOP: Families of Functions
- 158 ANS:
 $12x - 24 = 60$
- PTS: 2 REF: 081616ai TOP: Modeling Linear Equations

159 ANS:

$$0 \leq t \leq 1.5$$

$$0 = -16t^2 + 24t$$

$$0 = -8t(2t - 3)$$

$$t = 0, \frac{3}{2}$$

PTS: 2

REF: 061724ai

TOP: Graphing Quadratic Functions

KEY: context

160 ANS:

8.25

$$\frac{7}{3} \left(x + \frac{9}{28} \right) = 20$$

$$\frac{7}{3}x + \frac{3}{4} = \frac{80}{4}$$

$$\frac{7}{3}x = \frac{77}{4}$$

$$x = \frac{33}{4} = 8.25$$

PTS: 2

REF: 061405ai

TOP: Solving Linear Equations

KEY: fractional expressions

161 ANS:

 $f(x)$

PTS: 2

REF: 061606ai

TOP: Families of Functions

162 ANS:

$$a + c = 150$$

$$10.25a + 7.75c = 1470$$

PTS: 2

REF: 061605ai

TOP: Modeling Linear Systems

163 ANS:

speed of the car

PTS: 2

REF: 011709ai

TOP: Modeling Linear Functions

164 ANS:

$$(10 + x)(12 + x) = 180$$

PTS: 2

REF: 011611ai

TOP: Geometric Applications of Quadratics

165 ANS:

$$f(1) = 3, f(n + 1) = 2f(n) + 1$$

PTS: 2

REF: 011618ai

TOP: Sequences

166 ANS:

$$a_n = 4n + 8$$

PTS: 2

REF: 061424ai

TOP: Sequences

167 ANS:

$$4 \pm \sqrt{26}$$

$$x^2 - 8x + 16 = 10 + 16$$

$$(x - 4)^2 = 26$$

$$x - 4 = \pm\sqrt{26}$$

$$x = 4 \pm \sqrt{26}$$

PTS: 2

REF: 061722ai

TOP: Solving Quadratics

KEY: completing the square

168 ANS:

whole numbers greater than or equal to one

PTS: 2

REF: 081620ai

TOP: Domain and Range

169 ANS:

$$x \geq 11$$

$$3x + 2 \leq 5x - 20$$

$$22 \leq 2x$$

$$11 \leq x$$

PTS: 2

REF: 061609ai

TOP: Solving Linear Inequalities

170 ANS:

$$0 \leq y \leq 8$$

$$f(2) = 0$$

$$f(6) = 8$$

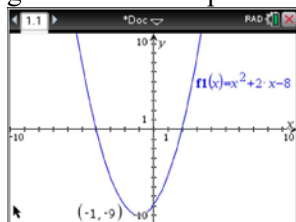
PTS: 2

REF: 081411ai

TOP: Domain and Range

KEY: limited domain

171 ANS:

greater than or equal to -9 

$$f(x) = x^2 + 2x - 8 = x^2 + 2x + 1 - 9 = (x + 1)^2 - 9$$

PTS: 2

REF: 061611ai

TOP: Domain and Range

KEY: real domain, quadratic

172 ANS:
-7 and 3

$$(x+2)^2 - 25 = 0$$

$$((x+2)+5)((x+2)-5) = 0$$

$$x = -7, 3$$

PTS: 2
KEY: AI

REF: 081418ai

TOP: Zeros of Polynomials