

Non-Calculator Part

1. The cost to manufacture x pairs of sunglasses can be represented by a function $C(x)$. Select from the drop-down menus to correctly complete the statement about function C .

If $C(4) = 398$, then

Choose ...

- 0
- 1
- 4
- 99.50
- 398

pairs of sunglasses cost \$

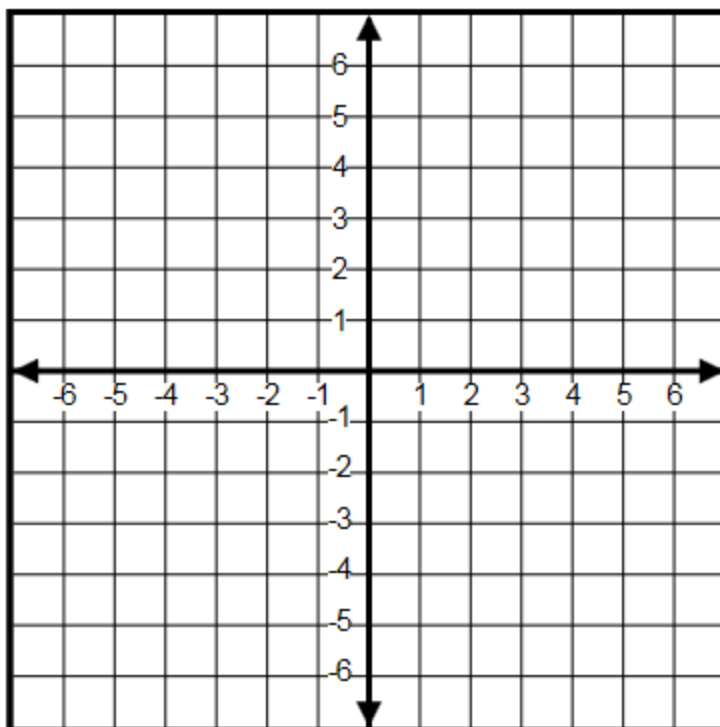
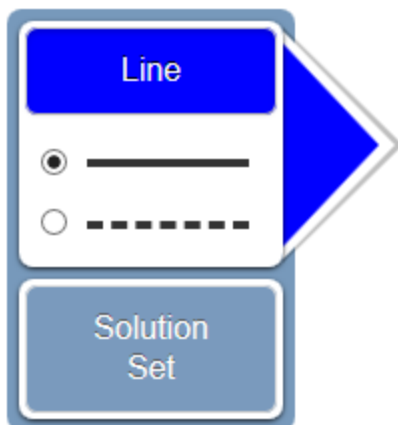
Choose ...

- 4.00
- 398.00
- 1592.00

2. Graph the solution set of $2x + y > 6$.

Graph the solution set of the linear inequality in the coordinate plane by

- selecting the “line” button to graph the line and choosing the line style,
- selecting the “solution set” button to select the desired region.



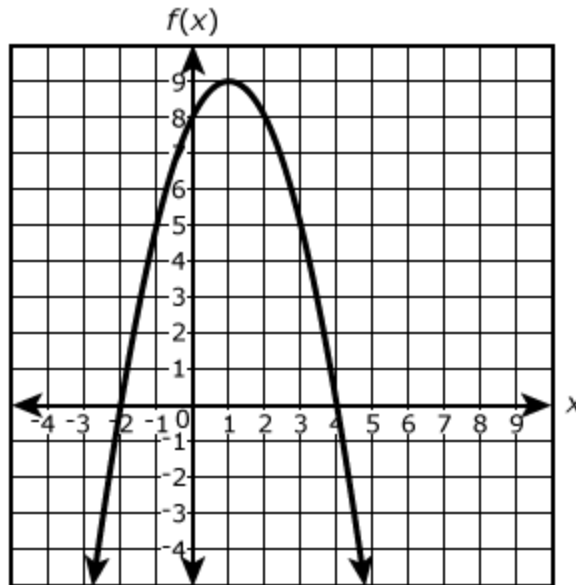
Non-Calculator Part (continued)

3. Determine all zeros for the function $f(x) = (x^2 + 2x - 8)(x - 6)$.

Drag and drop **all** zeros of the function into the box.

-48	-8	-6	-4	-2	0	2	4	6	8	48
-----	----	----	----	----	---	---	---	---	---	----

4. The figure shows a graph of the function $f(x)$ in the xy -coordinate plane.



A second function g is defined by $g(x) = -3x + 2$.

Select the correct phrase in each drop-down menu to complete the sentence.

$f(2)$

 Choose ...
 is less than
 is greater than
 is equal to

 $g(2)$ and $f(-2)$

 Choose ...
 is less than
 is greater than
 is equal to

 $g(-2)$.

Non-Calculator Part (continued)

5. Consider the equation $(x^2 + 3)^2 + 21 = 10x^2 + 30$.

Part A

Let $u = x^2 + 3$. Enter a number into each box such that the resulting equation is equivalent to $(x^2 + 3)^2 + 21 = 10x^2 + 30$ in terms of u .

Enter your answers in the boxes.

$$u^2 + \boxed{} u + \boxed{} = 0$$

Part B

What are the solutions of the equation $(x^2 + 3)^2 + 21 = 10x^2 + 30$?

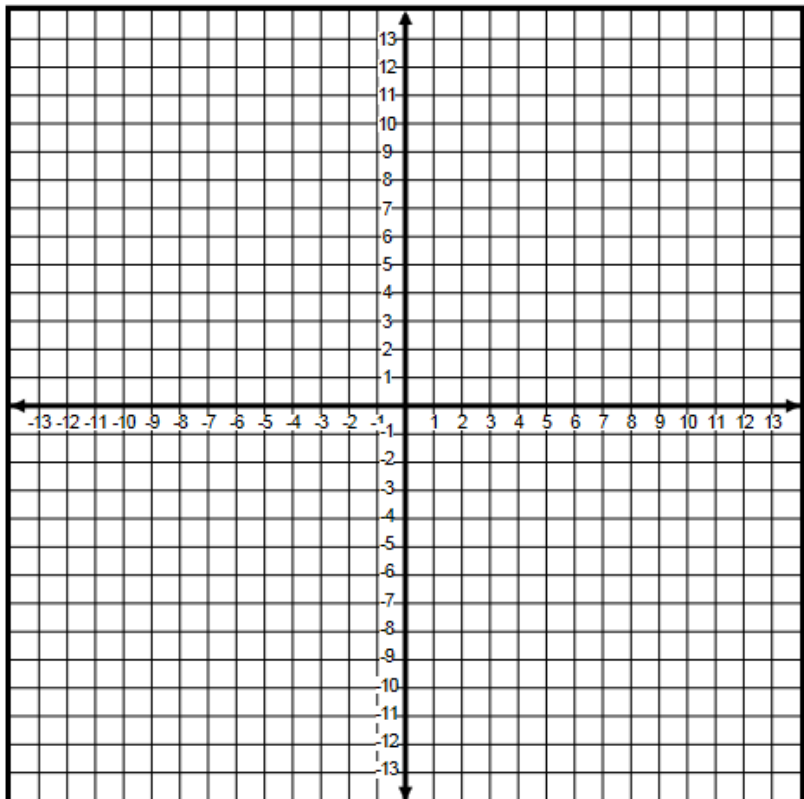
Enter your answers in the space provided. You may not need to use all answer boxes.

$$x = \boxed{} \quad x = \boxed{} \quad x = \boxed{} \quad x = \boxed{}$$

6. Graph $f(x) = -(x - 2)^2 + 4$.

- Select a button to choose the type of graph.
- Drag the two points to the correct positions.

Linear
Absolute Value
Quadratic
Exponential
Logarithmic
Sin/Cos
Tan/Cotan



Non-Calculator Part (continued)

7. Let a and b be rational numbers and let c be an irrational number.

Part A

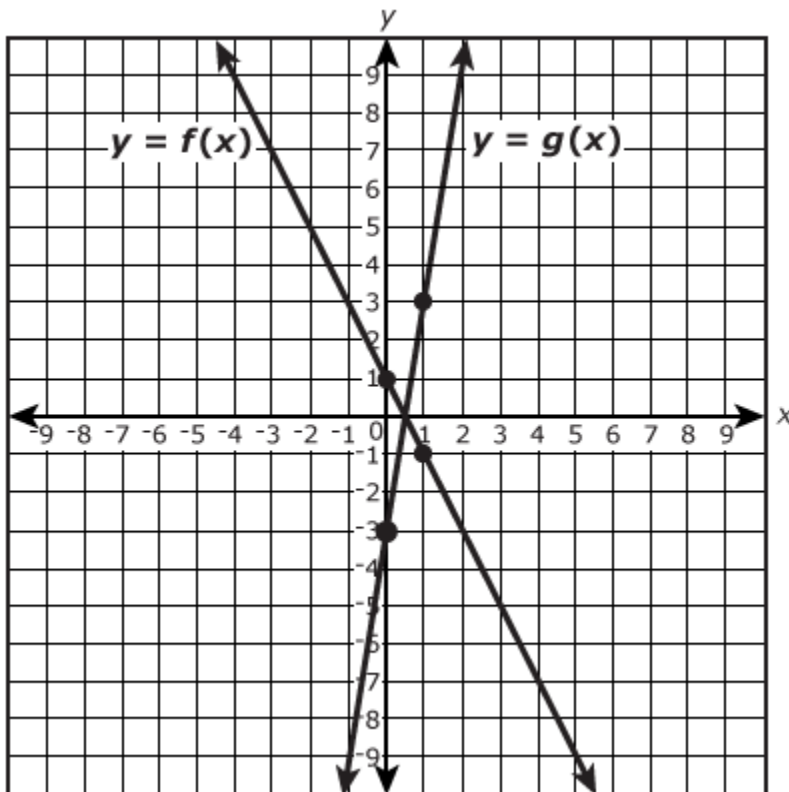
Select the appropriate cell in the table to show whether each value is always rational, never rational, or sometimes rational.

Value	$a + b$	$a - b$	c^2
Always Rational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Never Rational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes Rational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part B

Consider a quadratic equation with integer coefficients and two distinct zeros. If one zero is irrational, which statement is true about the other zero?

- A. The other zero must be rational.
 B. The other zero must be irrational.
 C. The other zero can be either rational or irrational.
 D. The other zero must be non-real.
8. The figure shows the graphs of the functions $y = f(x)$ and $y = g(x)$. The four indicated points all have integer coordinates.



If $g(x) = k \cdot f(x)$, what is the value of k ?

Enter your answer in the box.

$k =$

Calculator Part

The Texas Instruments TI-84+ online graphing calculator will be available for the Infrastructure Trials, Field Tests and Operational Tests. However, it is not available at this time for the non-secure practice tests. Users wishing to access this calculator may navigate to the PARCC practice landing page (<http://practice.parcctestnav.com>) and select the “Tutorials” tab for a link to a trial software version. Additionally, a handheld graphing calculator may be used to solve the math items in this section. Handheld calculator use is allowed during the PARCC test administration. Refer to PARCC’s calculator policy for information about calculator use on the PARCC assessment, (see Section 2.9 of the Test Coordinator Manual at <http://parcc.pearson.com/Manuals>).

1. Elephant Population Estimates – Namibia
Combined estimates for Etosha National Park and the Northwestern Population

Year	Base Year	Estimated Number of Elephants
1998	3	3,218
2000	5	3,628
2002	7	3,721
2004	9	3,571

The elephant population in northwestern Namibia and the Etosha National Park can be predicted by the expression $2,649(1.045)^b$, where b is the number of years since 1995.

What does the value 2,649 represent?

- A. the predicted increase in the number of elephants in the region each year
B. the predicted number of elephants in the region in 1995
C. the year when the elephant population is predicted to stop increasing
D. the percentage the elephant population is predicted to increase each year
2. Jerome is constructing a table of values that satisfies the definition of a function.

Input	-13	20	0	-4	11	-1	17	
Output	-15	-11	-9	-2	-1	5	5	13

What number(s) can be placed in the empty cell so that the table of values satisfies the definition of a function? Select **all** that apply.

- A. -5 B. -1 C. 0 D. 2 E. 11 F. 17

Calculator Part (continued)

3. A random sample of 200 teenagers participated in a taste test. Each teenager sampled four choices of fruit drink (labeled “A”, “B”, “C”, and “D”), and then were asked to pick a favorite. The table shows the results of this taste test.

	A	B	C	D	Total
Boys	45	25	30	20	120
Girls	20	10	30	15	80
Total	70	35	60	35	200

Note: As of 04/22/14 the value entered in the cell for girls preferring A is incorrect – it should be “25”.

Based on the information given, which of the given statements are true?
Select **all** that apply.

- A. 40% of the participants were girls.
- B. 70% of the participants preferred “A”.
- C. $\frac{20}{120}$ of the boys preferred “D”.
- D. $\frac{10}{35}$ of the participants who preferred “B” were girls.
- E. The proportion of the boys who preferred “C” is equal to the proportion of the girls who preferred “C”.
4. Fill in the missing portions of the function to rewrite $g(x) = 3x^2 - 33x - 180$ to reveal the zeros of the function. What are the zeros of $g(x)$?

Enter your answers in the boxes.

$$g(x) = 3(x + \boxed{})(x - \boxed{})$$

Zeros: $\boxed{}$ and $\boxed{}$

Calculator Part (continued)

5. What are the solutions to the equation $\frac{3}{4}x^2 = 48$?

Enter your answers in the space provided. Enter **only** your answers.

$x = \boxed{}$ and $x = \boxed{}$

6. A ball was thrown upward in the air. The height, in feet, of the ball above the ground t seconds after being thrown can be determined by the expression $-16t^2 + 40t + 3$. What is the meaning of 3 in the expression? Select the correct answer.

- A. The ball takes 3 seconds to reach its maximum height.
- B. The ball takes 3 seconds to reach the ground.
- C. The ball was thrown from a height of 3 feet.
- D. The ball reaches a maximum height of 3 feet.

7. A local theater sells admission tickets for \$9.00 on Thursday nights. At capacity, the theater holds 100 customers. The function $M(n) = 9n$ represents the amount of money the theater takes in on Thursday nights, where n is the number of customers. What is the domain of $M(n)$ in this context? Select the correct answer.

- A. all whole numbers
- B. all non-negative rational numbers
- C. all non-negative integers that are multiples of 9
- D. all non-negative integers less than or equal to 100

8. Caroline knows the height and the required volume of a cone-shaped vase she is designing. Which formula can she use to determine the radius of the vase? Select the correct answer.

(Note: the formula for the volume of a cone is given on the PARCC formula sheet for students' reference: $V = \frac{1}{3}\pi r^2 h$.)

- A. $r = \sqrt{\frac{V}{3\pi h}}$ B. $r = \sqrt{\frac{3V}{\pi h}}$ C. $r = \frac{\sqrt{3V}}{\pi h}$ D. $r = \pm \sqrt{\frac{3V}{\pi h}}$

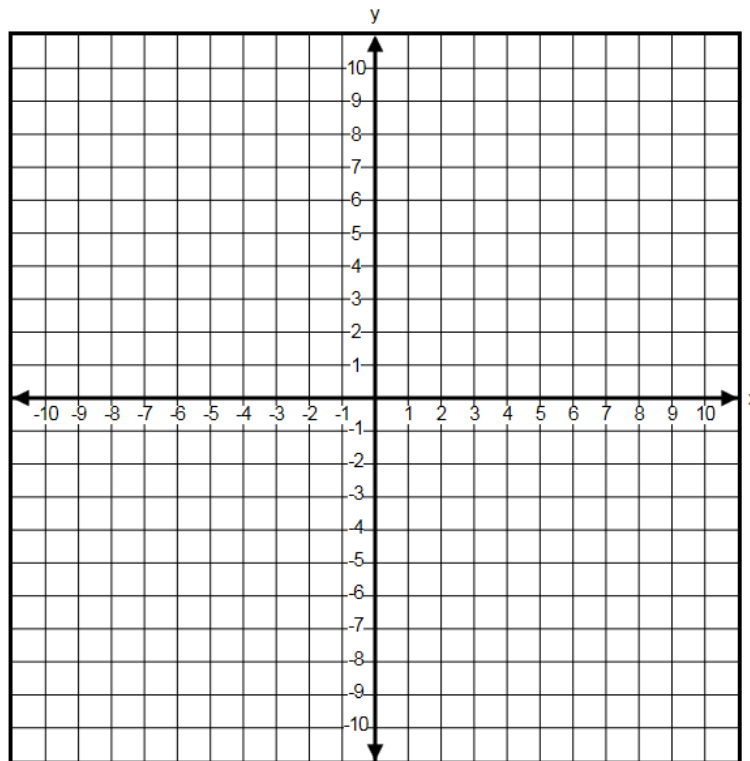
Calculator Part (continued)

9. Rewrite the expression $-3a(a + b - 5) + 4(-2a + 2b) + b(a + 3b - 7)$ to find the coefficients of each term. Enter the coefficients into the appropriate boxes.

$$\boxed{} a^2 + \boxed{} b^2 + \boxed{} ab + \boxed{} a + \boxed{} b$$

10. The ordered pairs $(20, -29.5)$, $(21, -31)$, and $(22, -32.5)$ are points on the graph of a linear equation. Graph the line that shows all of the ordered pairs in the solution set of this linear equation.

To graph a line, select two points in the coordinate plane. A line will be drawn through the points.



- 11.

$$y = x^2 - 2x - 5$$

$$y = x^3 - 2x^2 - 5x - 9$$

When the solutions to each of the two equations shown are graphed in the xy -coordinate plane, the graphs of the solutions intersect at a point. What is the y -coordinate of the point of intersection? Enter your answer in the box.

$$y = \boxed{}$$

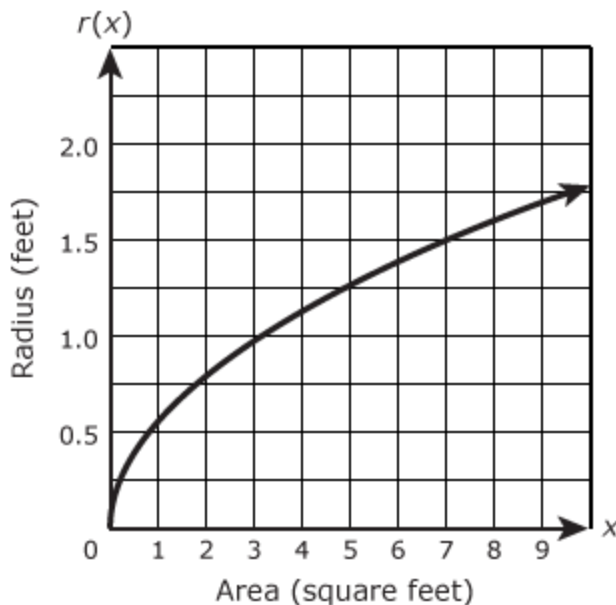
Calculator Part (continued)

12. A certain type of lily plant is going in a pond in such a way that the number of plants is growing exponentially. The number of plants N in the pond at time t is modeled by the function $N(t) = ab^t$, where a and b are constants and t is measured in months. The table shows two values of the function.

t	$N(t)$
0	150
1	450

Complete the equation. Enter your answer in the space provided.

13. The function $r(x)$ represents the radius of a circle for a given area x . A graph of the function is shown in the figure.



According to the graph what is the approximate average rate of change in the radius of the circle as the area increases from 3 square feet to 7 square feet?

- A. 0.125 foot per square foot
 - B. 0.25 foot per square foot
 - C. 0.5 foot per square foot
 - D. 8 feet per square foot
14. Rewrite the function $f(x) = 2x^2 - 8x + 9$ in vertex form by completing the square.

Enter your answers in the boxes.

$$f(x) = \boxed{} (x - \boxed{})^2 + \boxed{}$$

Therefore $f(x) = 2x^2 - 8x + 9$ has a minimum value of $\boxed{}$.

Calculator Part (continued)

15. In the equations listed, $a, b, c,$ and d are real numbers. Which of the equations could have solutions that are nonreal? Select **all** that apply.

A. $ax^2 = b$

B. $ax^2 + bx = 0$

C. $ax^2 + bx + c = 0$

D. $(ax + b)(cx + d) = 0$

E. $a(bx + c)^2 = d$

16. In a basketball game, Marlene made 16 field goals. Each of the field goals was worth either 2 points or 3 points, and Marlene scored a total of 39 points from field goals.

Part A

Let x represent the number of two-point field goals and y represent the number of three-point field goals. Write a system of equations in terms of x and y to model the situation. Enter your answer in the space provided. Enter **only** your system.

Part B

How many three-point field goals did Marlene make in the game? Enter your answer in the box.

Calculator Part (continued)

17. The students in a high school environmental club are trying to raise community awareness of a recycling program for old cell phones. Janine, a member of the club, created a website that members of the community can view to get more information about the program. The number of times that the website is viewed each day is recorded as a hit. On day 1, the website received 2 hits, and on day 3 the website received 8 hits.

Part A

Based on the data from days 1 and 3, Janine claims that the number of hits h on day d can be modeled by an exponential function. What is the number of hits predicted on day 6 by an exponential model? Enter your answer in the box.

Part B

Raul is also a member of the environmental club. He disagrees with Janine and claims that the number of hits each day can be modeled by a linear function.

Select from the drop-down menus to complete the sentences.

On day 2, the number of hits predicted by a linear model is

Choose ...
greater than
less than
equal to

the number of hits predicted by an exponential model.

On day 4, the number of hits predicted by a linear model is

Choose ...
greater than
less than
equal to

the number of hits predicted by an exponential model.

Calculator Part (continued)

18. Rachel manages a souvenir store. A popular item at the store is a small drum. The store typically sells 1,000 of these drums per month for \$10 each. Rachel knows that for each \$1 increase in the price of the drum, 20 fewer drums would be sold in a month.

Part A

Suppose $R(x)$ is a function that gives the month revenue, in dollars, based on x , the number of \$1 price increases. The monthly revenue can be found by multiplying the number of drums sold by the price of each drum.

Select from the drop-down menus to correctly complete the expression.

$$R(x) = \begin{array}{|l} \text{Choose ...} \\ (1,000 + 20x) \\ (1,000 - x) \\ (1,000 - 20x) \\ (1,000 + x) \end{array} \times \begin{array}{|l} \text{Choose ...} \\ (10 - x) \\ (10 + x) \\ (10 + 20x) \\ (10 - 20x) \end{array}$$

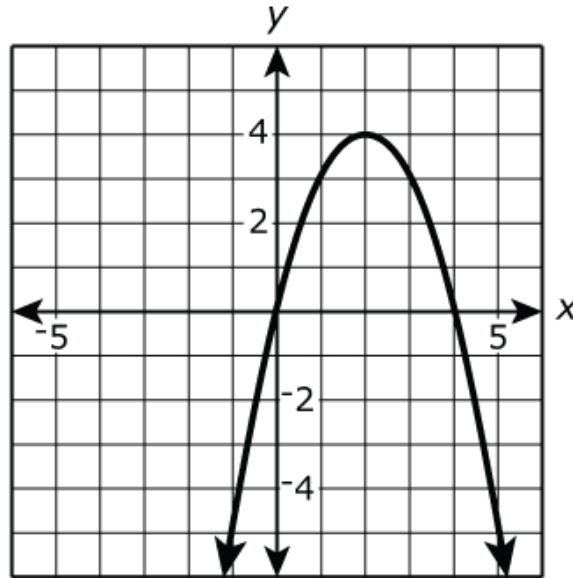
Part B

Which statements are true about R , the monthly revenue from sales of the small drum? Select **all** that apply.

- A. To maximize revenue the drum should be sold for \$20.
- B. To maximize revenue the drum should be sold for \$30.
- C. To maximize revenue the drum should have a price increase of \$20
- D. The revenue is the same for a price increase of \$10 and a price increase of \$30.
- E. The maximum revenue is \$8,000 more than the revenue from selling the drum at a price of \$10.

Calculator Part (continued)

19. The function $f(x) = 4x - x^2$ is graphed as shown.



Part A

Drag the correct word to the box with each given interval to indicate whether the function is increasing or decreasing on that interval.

(Note: The boxes "Increasing" and "Decreasing" can be selected multiple times.)

Increasing		Decreasing	
$x < 0$	$0 < x < 2$	$2 < x < 4$	$x > 4$

Part B

Drag the appropriate value, $f(x) < 0$ or $f(x) > 0$ to the box with each given interval.

(Note: The boxes " $f(x) < 0$ " and " $f(x) > 0$ " can be selected multiple times.)

$f(x) < 0$		$f(x) > 0$	
$x < 0$	$0 < x < 2$	$2 < x < 4$	$x > 4$

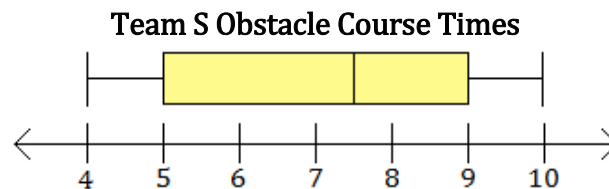
Calculator Part (continued)

20. Members of two cross-country teams ran an obstacle course. The table shows the times, in minutes and seconds, for the members of team R to complete the course.

Team R Obstacle Course Times

5:32	6:48	4:25	8:05	7:23
5:37	5:12	6:26	5:31	4:43
6:08	7:16	5:52	5:21	6:53
4:49	5:02	6:33	5:54	6:20

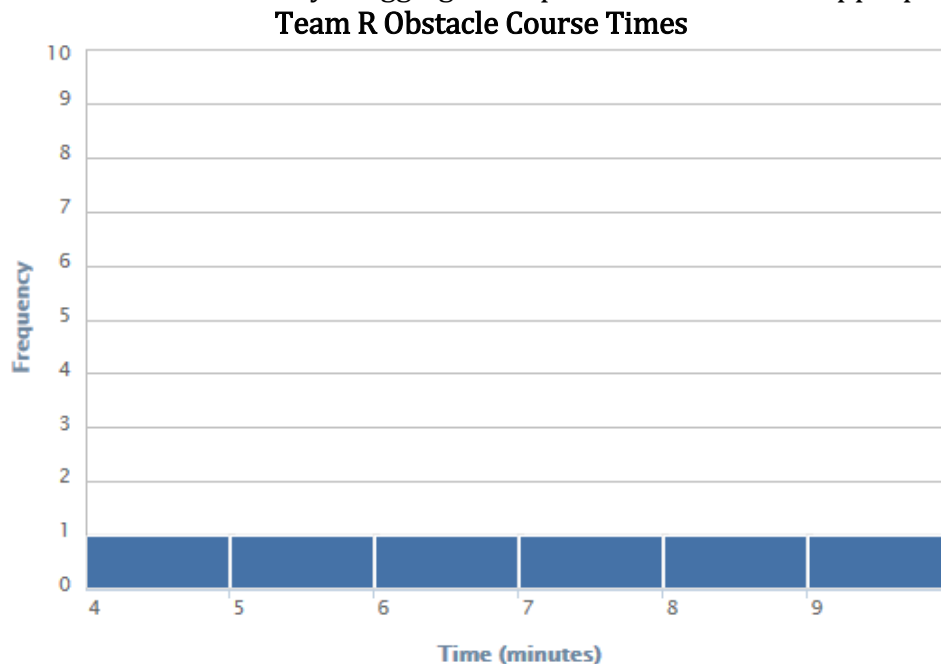
The obstacle course times, in minutes and seconds, for team S are summarized in the box plot shown.



Part A

Create a histogram showing the data for team R.

Adjust the size of the slider by dragging the top of the slider to the appropriate height.



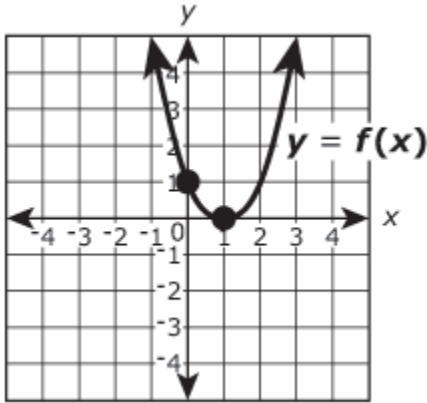
Part B

Which statements are true about the data for team R and team S? Select **all** that apply.

- A. The median time of team R is less than the median time of team S.
- B. The median time of team R is greater than the median time of team S.
- C. The interquartile range of team R is less than the interquartile range of team S.
- D. The interquartile range of team R is equal to the interquartile range of team S.
- E. The data for team R is skewed to the left.
- F. The data for team S includes an outlier.

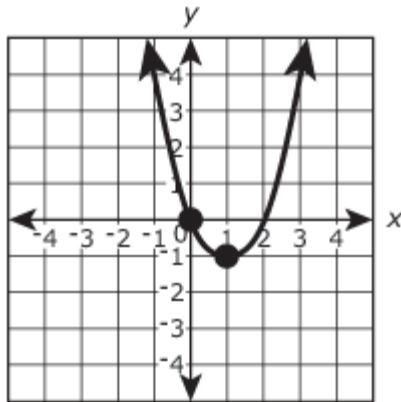
Calculator Part (continued)

21. Consider the function, $f(x)$, shown on the coordinate plane.



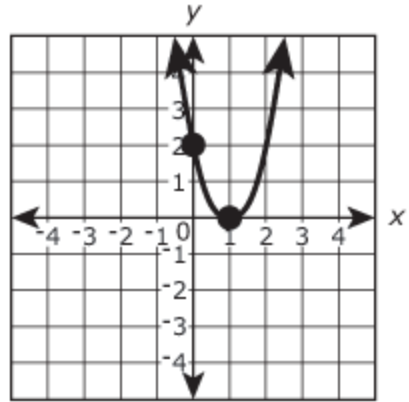
Identify the equations in the form $y = pf(x + r) + n$ which generate each of the graphs shown as a transformation of $f(x)$. Enter a number into **each** of the available boxes.

Part A



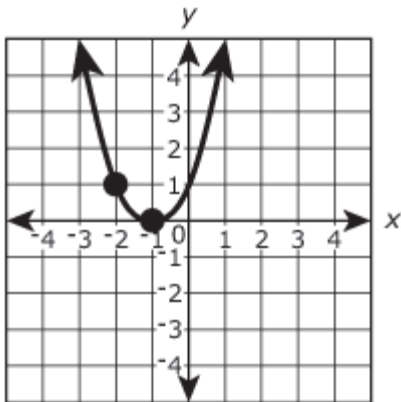
$y = \square f(x + \square) + \square$

Part B



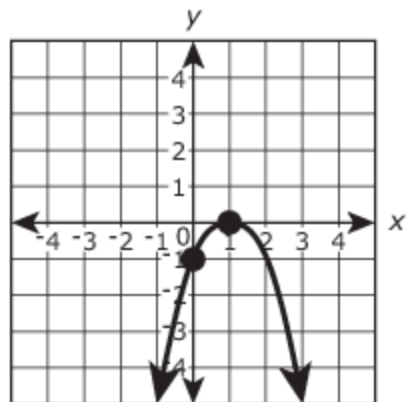
$y = \square f(x + \square) + \square$

Part C



$y = \square f(x + \square) + \square$

Part D



$y = \square f(x + \square) + \square$

Calculator Part (continued)

22. The population of a city in 2005 was 36,000. By 2010, the city's population had grown to 43,800 people.

Part A

Assume that the population of the city has grown linearly since 2005 and that it will continue to grow this way. What will be the population in 2015?

Enter your answer in the box.

 people

Part B

Suppose instead that the population of the city is growing exponentially. Write an expression for the population in terms of t , the number of years since 2005.

Enter your answer in the space provided. Enter **only** your expression.

Part C

Assume that the population of the city has grown exponentially since 2005 and that it will continue to grow this way. What will be the population in 2015? Give your answer to the nearest whole number.

Enter your answer in the box.

 people

Part D

Another town's population could be modeled by the function $P(t) = 27,400(1.66)^{\frac{t}{10}}$, where P represents the population and t represents the time, in years, since 2005. Based on the model, by approximately what percent does the population of this town increase each year?

- A. 1
- B. 3
- C. 5
- D. 7

Calculator Part (continued)

23. The area, A , of a pigpen on a farm can be modeled by the equation $A = -2x^2 + 36x$, where x is the width, in feet, of the pen.

Part A

When the equation is graphed in a coordinate plane, the x -intercepts are $(0, 0)$ and

Choose...
(4, 0)
(8, 0)
(18, 0)
(32, 0)

, which represent a lower bound and an upper bound for the possible

values for the

Choose ...
area
length
volume
width

of the pen.

Part B

What is the width of the pigpen, in feet, that gives the maximum area?

Enter your answer in the box.

24. Consider the function $f(x) = 2x^2 + 6x - 8$.

Part A

Fill in the missing portions of the equation to rewrite $f(x)$ to reveal the vertex of the graph of the function.

Enter your answers in the boxes. Use decimals if necessary.

$$f(x) = 2(x + \boxed{})^2 + \boxed{}$$

Part B

Fill in the missing portions of the equation to rewrite $f(x)$ to reveal the zeros of the function.

Enter your answers in the boxes. Use decimals if necessary.

$$f(x) = 2(x + \boxed{})(x + \boxed{})$$

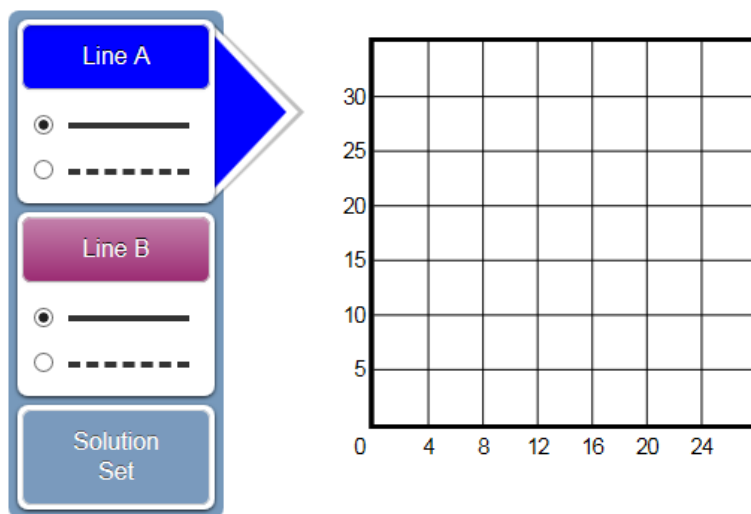
Calculator Part (continued)

25. Leah would like to earn at least \$120 per month. She babysits for \$5 per hour and works at an ice cream shop for \$8 per hour. Leah cannot work more than a total of 20 hours per month. Let x represent the number of hours Leah babysits and y represent the number of hours Leah works at the ice cream shop.

Part A

Graph the solution set of the system of linear inequalities in the coordinate plane by:

- selecting the “Line A” button, plotting two points and then choosing the line style to graph the number of hours Leah can work at both jobs to total no more than 20 hours.
- selecting the “Line B” button, plotting two points and then choosing the line style to graph the number of hours she needs to work at both jobs to earn at least \$120.
- selecting the “Solution Set” button to select the desired region.



Part B

Which pairs (x, y) represent hours that Leah could work to meet the given conditions? Select **all** that apply.

- A. (4, 15) B. (5, 12) C. (10, 9) D. (15, 5) E. (19, 1)

Part C

Given the conditions in Part A, if Leah babysits for 7 hours this month, what is the minimum number of hours she would have to work at the ice cream shop to earn at least \$120 per month? Give your answer to the nearest whole hour. Enter your answer in the box.

hours

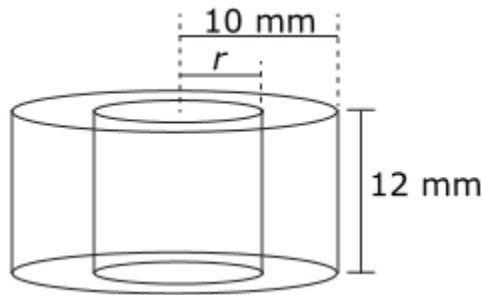
Part D

Given the conditions in Part A, Leah prefers babysitting over working at the ice cream store. What is the maximum number of hours she can babysit to be able to earn at least \$120 per month? Give your answer to the nearest whole hour. Enter your answer in the box.

hours

Calculator Part (continued)

26. The diagram shows two cylinders with bases that have the same center and heights of 12 millimeters.



Part A

Which is a function for the volume, V , that is inside the larger cylinder but outside the one with the smaller radius r ?

(Note: the formula for the volume of a cylinder is given on the PARCC formula sheet for students' reference: $V = \pi r^2 h$.)

- A. $V(r) = 1,200\pi - 12\pi r^2$ B. $V(r) = 120\pi - 12\pi r^2$
 C. $V(r) = 12\pi r^2$ D. $V(r) = 12\pi(10 - r)^2$

Part B

Suppose that there is space between the inner and outer cylinders and the radius of the inner cylinder must be an integer greater than or equal to 3. What is the domain of V ?

- A. all integers greater than or equal to 3 B. 3, 4, 5, 6, 7, 8, 9, or 10
 C. 3, 4, 5, 6, 7, 8, or 9 D. $3 \leq m \leq 9$

Note: As of 04/22/14 the parameter used in answer option D is incorrect. The option should read " $3 \leq r \leq 9$ ".)

27. The function f is defined by $f(x) = x^2 - 2x - 24$.

Part A

If $f(x + 3) = x^2 + kx - 21$, what is the value of k ?

Enter your answer in the box.

Part B

What are the zero(s) of $f(x + 3)$? Select **all** that apply.

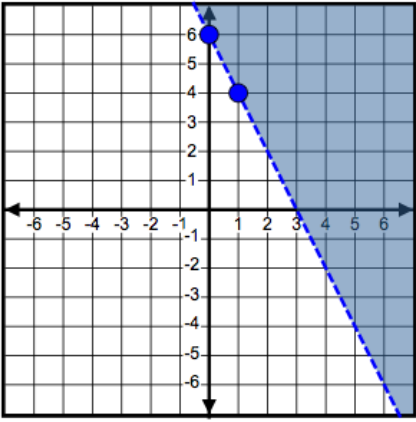
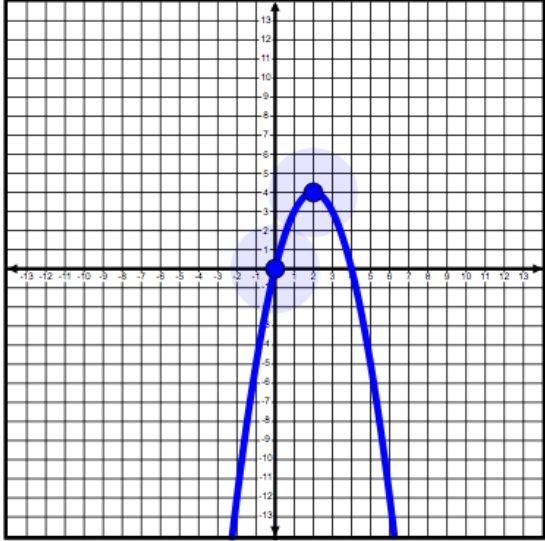
- A. $x = -7$ B. $x = -4$ C. $x = -2$
 D. $x = 0$ E. $x = 3$ F. $x = 6$

M

A

T

H

Item Number	Answer Key	Evidence Statement Keys
Part 1: Non-Calculator		
1	If $C(4) = 398$, then <input type="text" value="4"/> pairs of sunglasses cost \$ <input type="text" value="398.00"/> .	F-IF.A.Int.1
2		A-REI.12
3	<input type="text" value="6"/> <input type="text" value="-4"/> <input type="text" value="2"/> in any order.	A-APR.3-1
4	$f(2)$ is greater than <input type="text" value="-"/> $g(2)$ and $f(-2)$ is less than <input type="text" value="-"/> $g(-2)$.	F-IF.9-1
5	Part A: $u^2 +$ <input type="text" value="-10"/> $u +$ <input type="text" value="21"/> $= 0$ Part B: -2, 2, 0	A-Int.1
6		F-IF.7a-2

M

A

T

H

	Part A:																	
	<table border="1"> <thead> <tr> <th>Value</th> <th>$a + b$</th> <th>$a - b$</th> <th>c^2</th> </tr> </thead> <tbody> <tr> <td>Always Rational</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Never Rational</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>Sometimes Rational</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> </tbody> </table>	Value	$a + b$	$a - b$	c^2	Always Rational	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Never Rational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sometimes Rational	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
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7	Part B: B	N-RN.3																
8	-3	F-BF.3-1																
Part 2: Calculator																		
1	B	A-SSE.1-1																
2	A, D	F-IF.1																
3	A, C, D	S-ID.5																
4	$g(x) = 3(x + 4)(x - 15)$ Zeros: -4 and 15	A-SSE.3a																
5	8, -8	A-REI.4b-1																
6	C	A-SSE.1-2																
7	D	F-IF.5-1																
8	B	A-CED.4-2																
9	-3 $a^2 + 3$ $b^2 + -2$ $ab + 7$ $a + 1$ b	A-APR.1-1																
10		A-REI.10																

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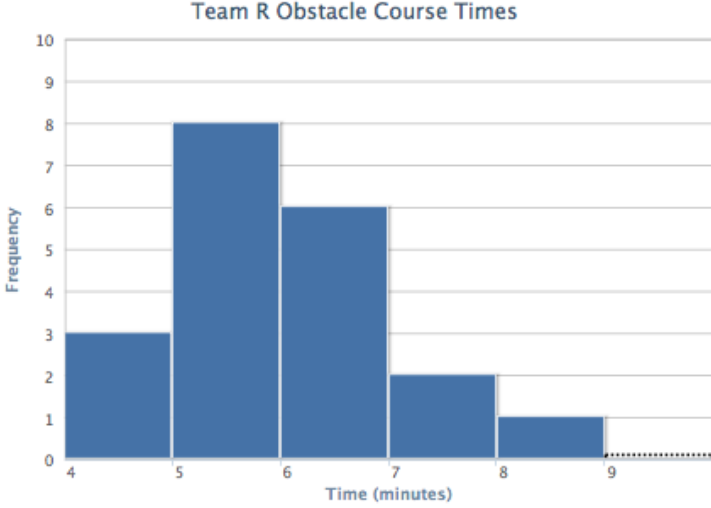
11	3	A-REI.11-1b
12	$N(t) = 150(3)^t$	F-LE.2-1
13	A	F-IF.6-6b
14	$f(x) = \boxed{2} (x - \boxed{2})^2 + \boxed{1}$ Therefore, $f(x) = 2x^2 - 8x + 9$ has a minimum value of $\boxed{1}$.	A-SSE.3b
15	A, C, E	A-REI.4b-2
16	Part A: $x + y = 16$ $2x + 3y = 39$ Part B: 7	A-REI.6-1
17	A: 64 B: On day 2, the number of hits predicted by a linear model is <input type="text" value="greater than"/> the number of hits predicted by an exponential model. On day 4, the number of hits predicted by a linear model is <input type="text" value="less than"/> the number of hits predicted by an exponential model.	F-LE.2-2
18	$R(x) = \boxed{(1,000 - 20x)} \times \boxed{(10 + x)}$ Part A: Part B: B, C, D, E	HS-Int.1
19	Part A: <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $x < 0$ Increasing </div> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $0 < x < 2$ Increasing </div> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $2 < x < 4$ Decreasing </div> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $x > 4$ Decreasing </div> </div> Part B: <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $x < 0$ $f(x) < 0$ </div> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $0 < x < 2$ $f(x) > 0$ </div> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $2 < x < 4$ $f(x) > 0$ </div> <div style="border: 1px solid gray; padding: 5px; text-align: center;"> $x > 4$ $f(x) < 0$ </div> </div>	F-IF.4-1

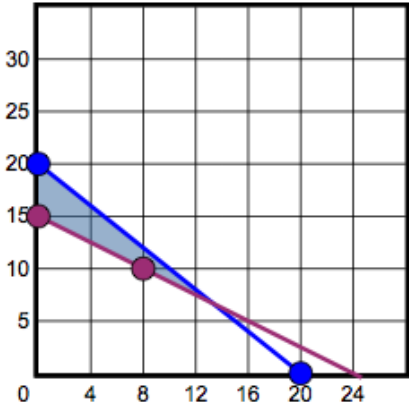
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20	<p>Part A:</p>  <table border="1"> <caption>Team R Obstacle Course Times</caption> <thead> <tr> <th>Time (minutes)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr><td>4</td><td>3</td></tr> <tr><td>5</td><td>8</td></tr> <tr><td>6</td><td>6</td></tr> <tr><td>7</td><td>2</td></tr> <tr><td>8</td><td>1</td></tr> <tr><td>9</td><td>0</td></tr> </tbody> </table> <p>Part B: A, C</p>	Time (minutes)	Frequency	4	3	5	8	6	6	7	2	8	1	9	0	S-ID.Int.2
Time (minutes)	Frequency															
4	3															
5	8															
6	6															
7	2															
8	1															
9	0															
21	<p>Part A:</p> $y = 1 f(x + 0) + -1$ <p>Part B:</p> $y = 2 f(x + 0) + 0$ <p>Part C:</p> $y = 1 f(x + 2) + 0$ <p>Part D:</p> $y = -1 f(x + 0) + 0$	F-BF.3-4														
22	<p>Part A: 51600 Part B: $36000(1.04)^t$ Part C: 53289 Part D: C</p>	HS-Int.3-1														

23	<p>Part A: When the equation is graphed in a coordinate plane, the x-intercepts are (0,0) and (18,0), which represent a lower bound and an upper bound for the possible values for the width of the pen.</p> <p>Part B: 9</p>	F-IF.8a
24	<p>Part A: $f(x) = 2(x + 1.5)^2 + -12.5$</p> <p>Part B: $f(x) = 2(x + 4)(x + -1)$</p>	A-SSE.2-4
25	 <p>Part A: Part B: A, B, C Part C: 11 Part D: 13</p>	A-CED.3-1
26	<p>Part A: A Part B: C</p>	F-Int.1-1
27	<p>Part A: 4 Part B: A, E</p>	HS-Int.2