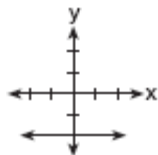


NAME: _____

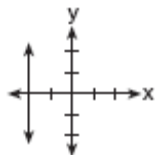
1. 060523a, P.I. A.A.36

Which graph represents the equation $x = 2$?

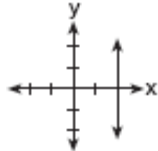
[A]



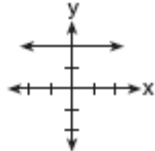
[B]



[C]



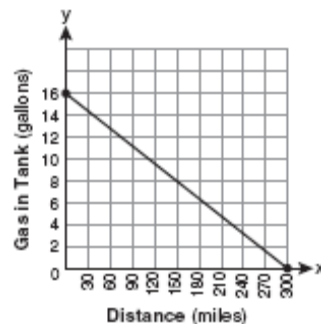
[D]



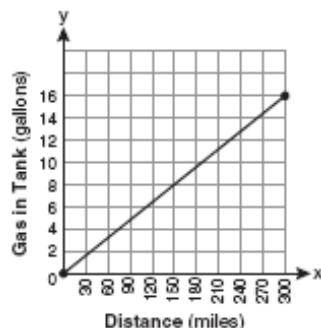
2. 080807ia, P.I. A.G.4

The gas tank in a car holds a total of 16 gallons of gas. The car travels 75 miles on 4 gallons of gas. If the gas tank is full at the beginning of a trip, which graph represents the rate of change in the amount of gas in the tank?

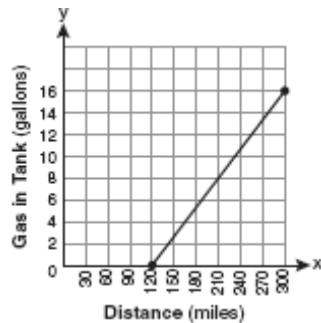
[A]



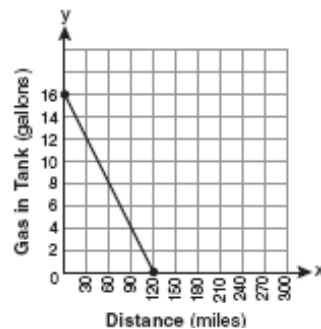
[B]



[C]



[D]

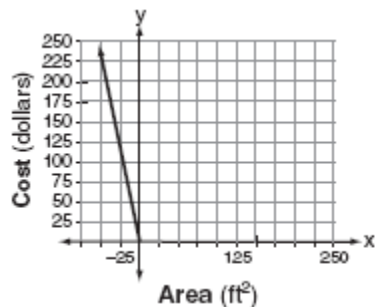


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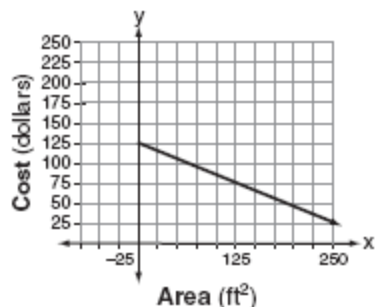
3. 080703a, P.I. A.G.4

Super Painters charges \$1.00 per square foot plus an additional fee of \$25.00 to paint a living room. If x represents the area of the walls of Francesca's living room, in square feet, and y represents the cost, in dollars, which graph best represents the cost of painting her living room?

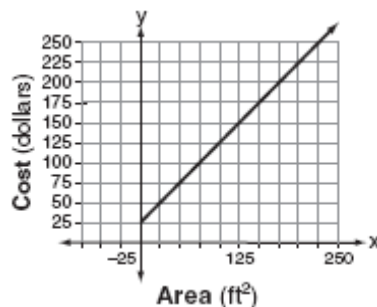
[A]



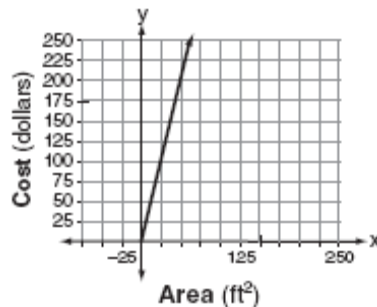
[B]



[C]



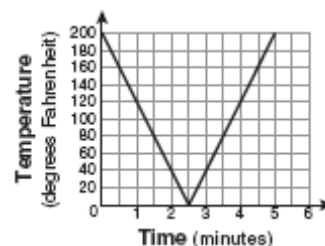
[D]



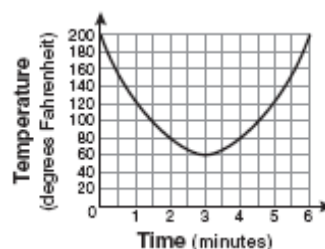
4. 010905ia, P.I. A.G.4

Antwaan leaves a cup of hot chocolate on the counter in his kitchen. Which graph is the best representation of the change in temperature of his hot chocolate over time?

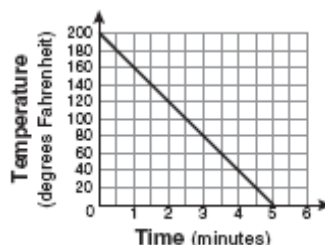
[A]



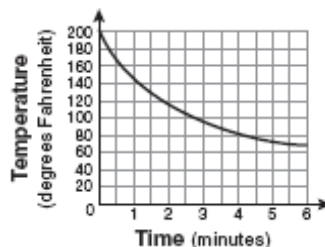
[B]



[C]



[D]

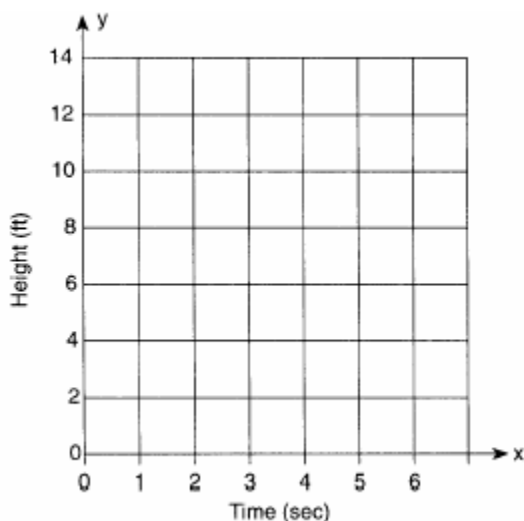


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5. 010031a, P.I. A.G.4

Amy tossed a ball in the air in such a way that the path of the ball was modeled by the equation $y = -x^2 + 6x$. In the equation, y represents the height of the ball in feet and x is the time in seconds.

a Graph $y = -x^2 + 6x$ for $0 \leq x \leq 6$ on the grid provided below.

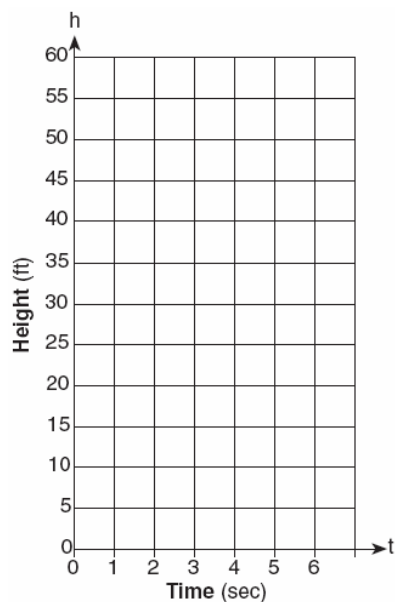


b At what time, x , is the ball at its highest point?

6. 010439a, P.I. A.G.4

Tom throws a ball into the air. The ball travels on a parabolic path represented by the equation $h = -8t^2 + 40t$, where h is the height, in feet, and t is the time, in seconds.

a On the accompanying set of axes, graph the equation from $t = 0$ to $t = 5$ seconds, including all integral values of t from 0 to 5.



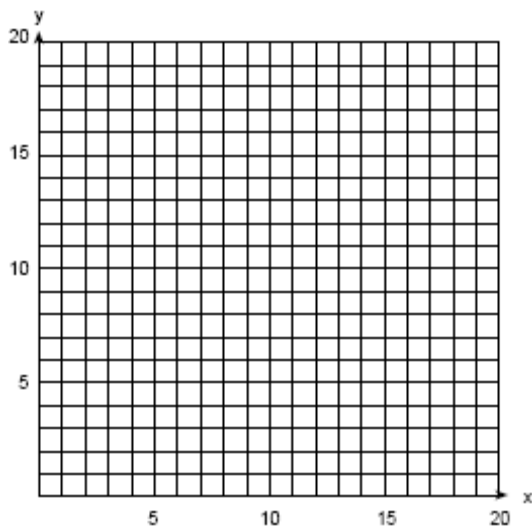
b What is the value of t at which h has its greatest value?

NAME: _____

7. 089933a, P.I. A.G.4

An arch is built so that it is 6 feet wide at the base. Its shape can be represented by a parabola with the equation $y = -2x^2 + 12x$, where y is the height of the arch.

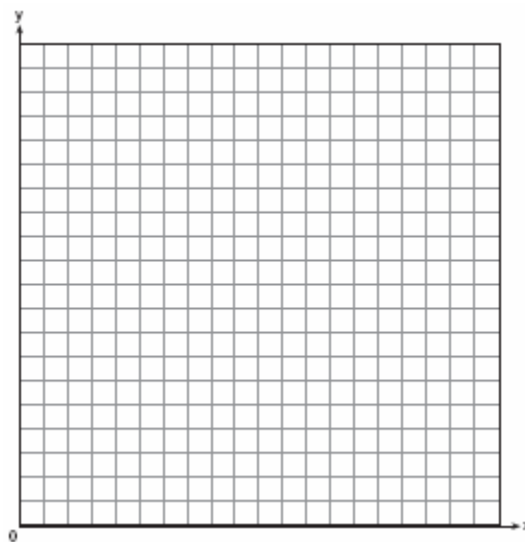
a Graph the parabola from $x = 0$ to $x = 6$ on the grid below.



b Determine the maximum height, y , of the arch.

8. 060333a, P.I. A.G.4

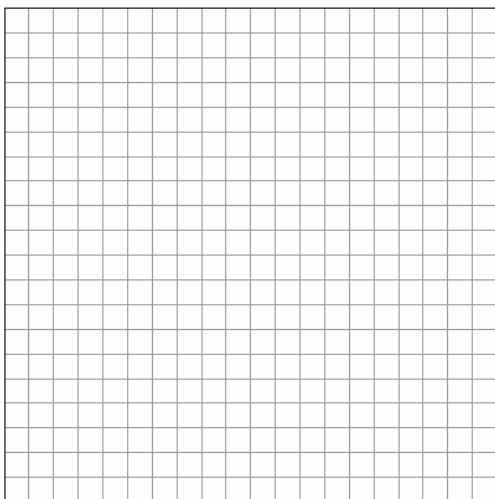
An architect is designing a museum entranceway in the shape of a parabolic arch represented by the equation $y = -x^2 + 20x$, where $0 \leq x \leq 20$ and all dimensions are expressed in feet. On the accompanying set of axes, sketch a graph of the arch and determine its maximum height, in feet.



NAME: _____

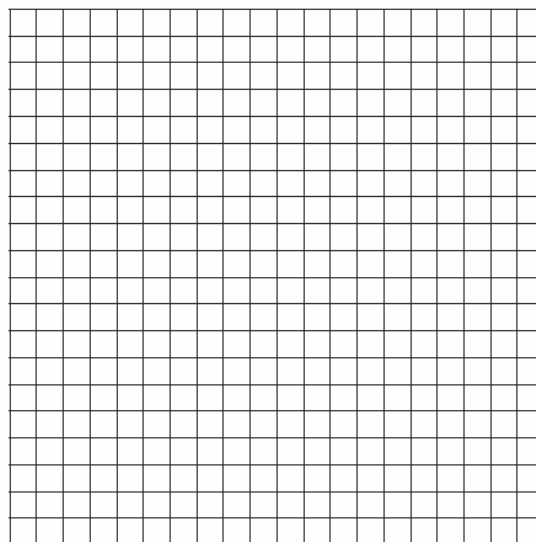
9. 060430b

A baseball player throws a ball from the outfield toward home plate. The ball's height above the ground is modeled by the equation $y = -16x^2 + 48x + 6$ where y represents height, in feet, and x represents time, in seconds. The ball is initially thrown from a height of 6 feet. How many seconds after the ball is thrown will it again be 6 feet above the ground? What is the maximum height, in feet, that the ball reaches? [The use of the grid is optional.]



10. 060822b, P.I. A.A.41

A laundry owner's estimate of her weekly profits, p , in dollars, is given by the equation $p = -4w^2 + 160w$, where w represents the number of workers she hires. What is the number of workers she should hire in order to earn the greatest profit? [The use of the grid is optional.]

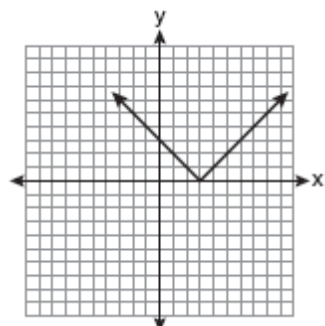


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11. fall0722ia, P.I. A.G.4

The diagram below shows the graph of

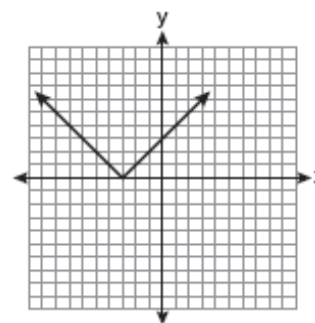
$$y = |x - 3|.$$



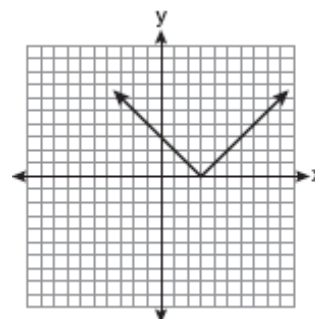
Which diagram shows the graph of

$$y = -|x - 3|?$$

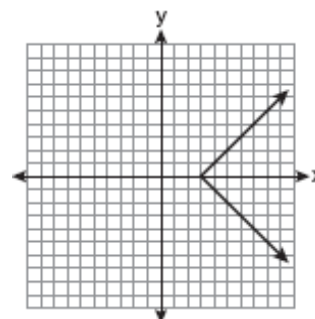
[A]



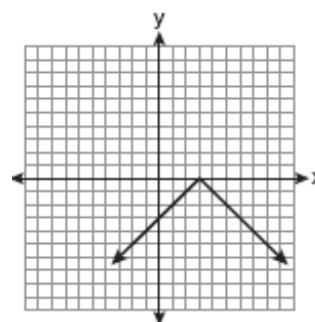
[B]



[C]



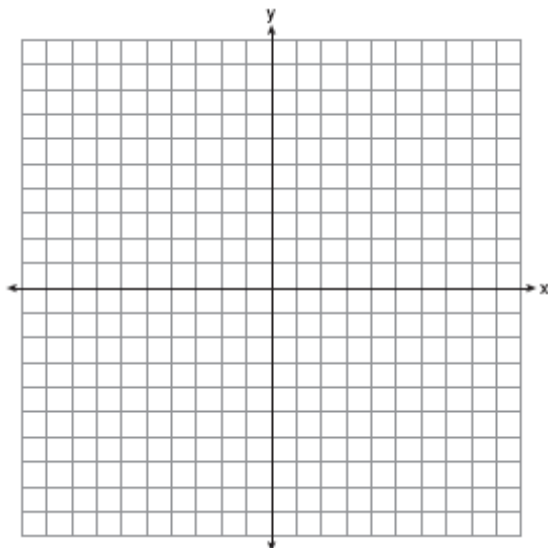
[D]



NAME: _____

12. 080835ia, P.I. A.G.4

On the set of axes below, draw the graph of $y = 2^x$ over the interval $-1 \leq x \leq 3$. Will this graph ever intersect the x -axis? Justify your answer.



[1] C _____

[2] A _____

[3] C _____

[4] D _____

a [3] A parabola is correctly graphed through (0,0), (1,5), (2,8), (3,9), (4,8), (5,5), and (6,0).

[2] The correct table of values is shown but is not graphed through the entire domain.

or [2] The correct points are graphed but as a broken line graph not a curve.

or [2] At least three values are correctly calculated and graphed.

[1] At least two of the values are correctly calculated, and the student tried to graph all points.

b [1] 3

or [1] The correct time, x , for an incorrect graph in part a is found.

a and b [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[5] obviously incorrect procedure. _____

a [3] A parabola with points graphed at (0,0), (1,32), (2,48), (3,48), (4,32), and (5,0) is shown. [Points do not have to be labeled on the graph for full credit.]

[2] Appropriate work is shown, such as a table of values, but one graphing error is made.

or [2] The correct points are graphed, but the parabola is drawn incorrectly, such as connecting (2,48) and (3,48) as a line segment or not connecting the points at all.

or [2] At least four correct values are found, and the parabola is graphed appropriately.

or [2] A correct table of values is shown for all values from 0 to 5, but no graph is drawn.

[1] Two or three correct values are found, and the parabola is graphed appropriately.

or [1] A correct table of values is shown for an incorrectly transcribed equation, such as $h = 8t^2 + 40t$, but no graph is drawn.

b [1] 2.5 is found algebraically or identified from a table or from the graph of the parabola.

or [1] An appropriate value of t is found, based on an incorrect graph.

or [1] $2 < t < 3$ is given as the range of values based on the line segment drawn in part a.

a and b [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[6] obviously incorrect procedure. _____

- a [3] A parabola is correctly graphed through (0,0), (1,10), (2,16), (3,18), (4,16), (5,10), and (6,0).
[2] A correct table of values is shown, but not all the points are graphed correctly.
or [2] The correct points are graphed but as a broken-line graph, not a curve.
or [2] At least four values are calculated correctly and graphed.
[1] The student has at least two of the values calculated correctly and has tried to graph all the points.
[0] Fewer than two values are calculated correctly.
b [1] A maximum height of 18 is found.
or [1] Correct y is found for an incorrect graph in part a.
a and b [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-

- [4] 100 and a correct parabolic arch is drawn, and appropriate work is shown, such as a table of values for the parabola or correctly labeled points.
[3] 100 and a correct parabolic arch is drawn, but no table of values or labeled points are shown.
or [3] 100 and a correct parabolic arch is drawn, and appropriate work is shown, but no scale or an incorrect scale is shown.
or [3] A correct parabolic arch is drawn, but the maximum height is missing or is incorrect.
[2] An incorrect parabolic arch is drawn, but an appropriate maximum height is found.
or [2] A correct height is determined algebraically, but a parabolic arch is not drawn.
or [2] 100 and an appropriate parabolic arch is drawn, but it is not drawn between $0 \leq x \leq 20$.
[1] A correct parabolic arch is drawn, but no work is shown, such as a table of values or correctly labeled points, and the maximum height is missing or is incorrect.
or [1] 100, but no work is shown and no parabolic arch is drawn.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-

[4] 3 and 42, and appropriate work is shown, such as a graph, substitution, or a table of values.

[3] Appropriate work is shown, but one computational or graphing error is made.

[2] Appropriate work is shown, but two or more computational or graphing errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] The number of seconds is found correctly, and appropriate work is shown, but the height is not found or is found incorrectly.

or [2] The height is found correctly, and appropriate work is shown, but the number of seconds is not found or is found incorrectly.

[1] 3 and 42, but no work is shown.

[0] 3 or 42, but no work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[9] obviously incorrect procedure.

[2] 20, and appropriate work is shown, such as finding the turning point or sketching the graph of the equation.

[1] Appropriate work is shown, but one computational or graphing error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] The graph of the equation is sketched correctly, but no further correct work is shown.

or [1] (20,1600) is identified as the turning point, but the number of workers is not stated.

or [1] 20, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure.

[11] D _____

[3] A correct graph is drawn over the given interval, the function is identified as one that will not intersect the x -axis, and an appropriate justification is given.

[2] Appropriate work is shown, but one graphing error is made, but an appropriate answer and justification are given.

or [2] A correct graph is drawn over the given interval, but no further correct work is shown.

[1] Appropriate work is shown, but two or more graphing errors are made, but an appropriate answer and justification are given.

or [1] Appropriate work is shown, but one conceptual error is made, but an appropriate answer and justification are given.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[12] incorrect procedure.
