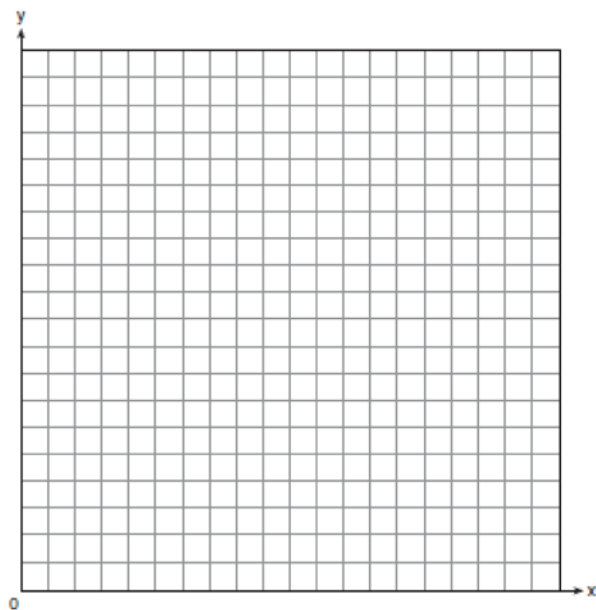
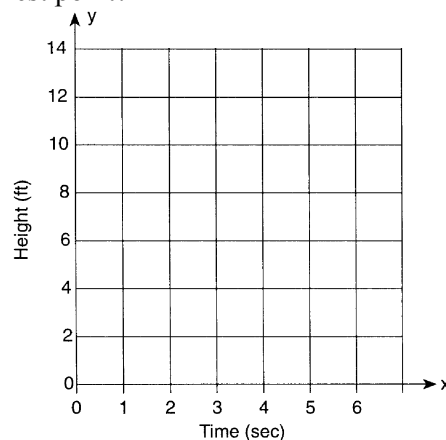


A.G.4: Graphing Quadratic Functions: Identify and graph linear, quadratic (parabolic), absolute value, and exponential functions

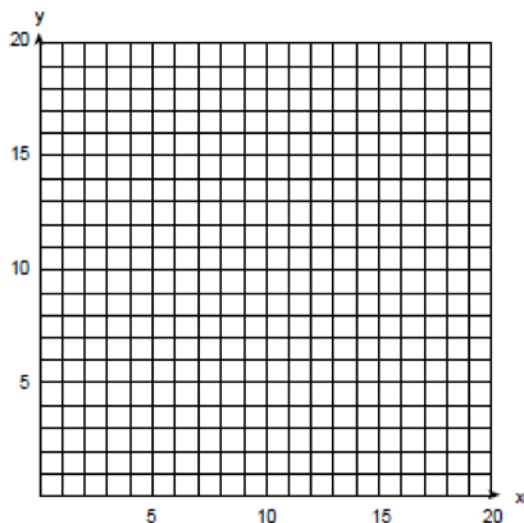
- 1 An architect is designing a museum entranceway in the shape of a parabolic arch represented by the equation $y = -x^2 + 20x$, where $0 \leq x \leq 20$ and all dimensions are expressed in feet. On the accompanying set of axes, sketch a graph of the arch and determine its maximum height, in feet.



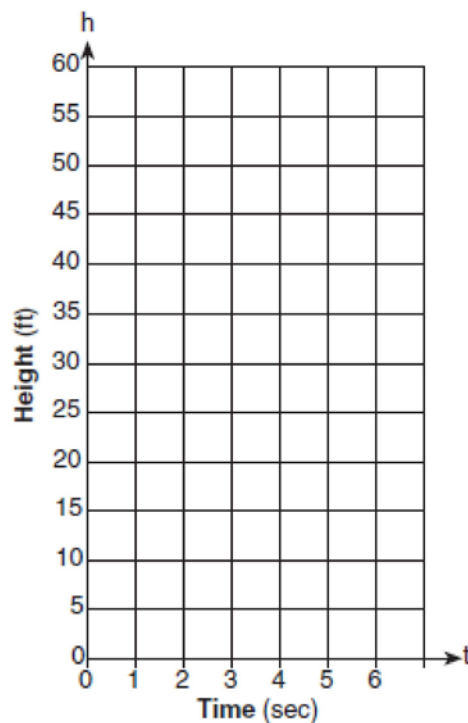
- 2 Amy tossed a ball in the air in such a way that the path of the ball was modeled by the equation $y = -x^2 + 6x$. In the equation, y represents the height of the ball in feet and x is the time in seconds. Graph $y = -x^2 + 6x$ for $0 \leq x \leq 6$ on the grid provided below. At what time, x , is the ball at its highest point?



- 3 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. Graph the parabola from $x = 0$ to $x = 6$ on the grid below. Determine the maximum height, y , of the arch.

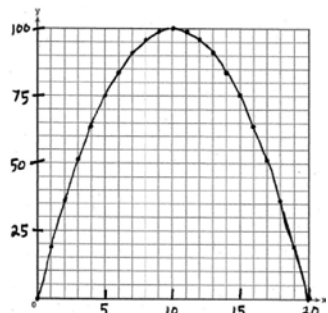


- 4 Tom throws a ball into the air. The ball travels on a parabolic path represented by the equation $h = -8t^2 + 40t$, where h is the height, in feet, and t is the time, in seconds.
- a On the accompanying set of axes, graph the equation from $t = 0$ to $t = 5$ seconds, including all integral values of t from 0 to 5.
- b What is the value of t at which h has its greatest value?



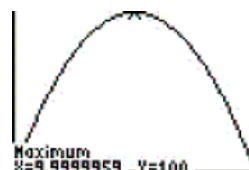
A.G.4: Graphing Quadratic Functions: Identify and graph linear, quadratic (parabolic), absolute value, and exponential functions
Answer Section

1 ANS:



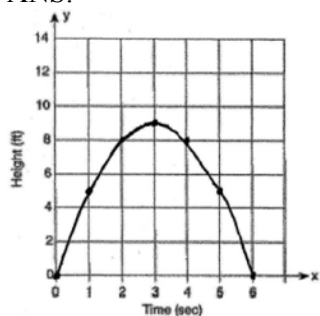
$$100. \quad x = \frac{-b}{2a} = \frac{-(20)}{2(-1)} = 10$$

$$y = -10^2 + 20(10) = 100$$

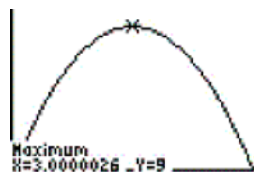


REF: 060333a

2 ANS:

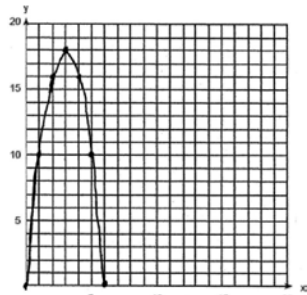


$$3. \quad x = \frac{-b}{2a} = \frac{-(6)}{2(-1)} = 3$$



REF: 010031a

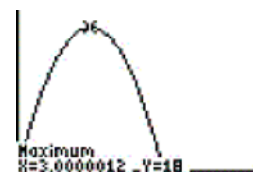
3 ANS:



$$18. \quad x = \frac{-b}{2a} = \frac{-(12)}{2(-2)} = 3$$

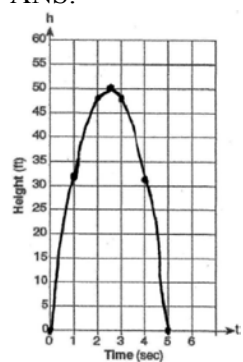
$$y = -2(3)^2 + 12(3) = 18$$

WINDOW
 Xmin=0
 Xmax=10
 Xscl=0
 Ymin=0
 Ymax=20
 Yscl=0
 Xres=1

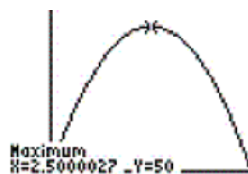


REF: 089933a

4 ANS:



$$2.5. \quad t = \frac{-b}{2a} = \frac{-(40)}{2(-8)} = 2.5.$$



REF: 010439a