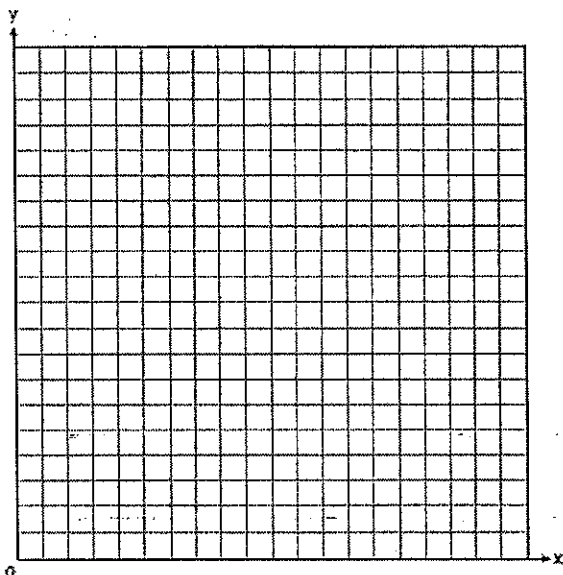
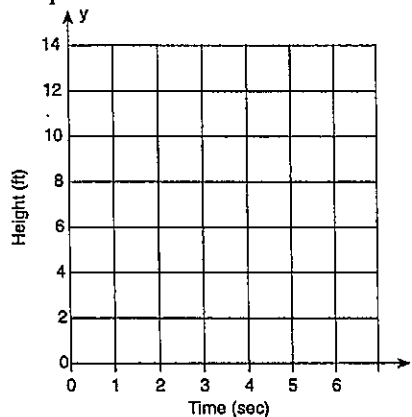


**A.G.4: Graphing Quadratic Functions: Identify and graph linear, quadratic (parabolic), absolute value, and exponential functions**

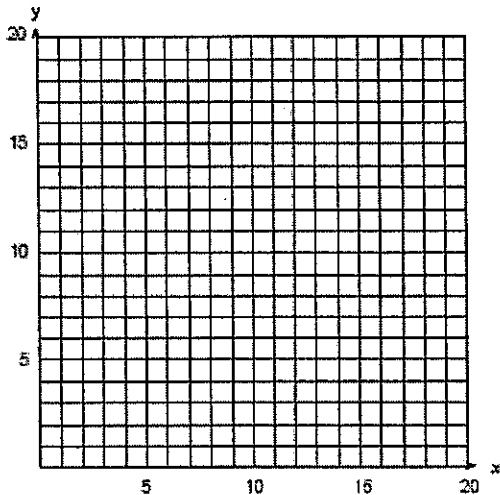
- 1 An architect is designing a museum entranceway in the shape of a parabolic arch represented by the equation  $y = -x^2 + 20x$ , where  $0 \leq x \leq 20$  and all dimensions are expressed in feet. On the accompanying set of axes, sketch a graph of the arch and determine its maximum height, in feet.



- 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?

