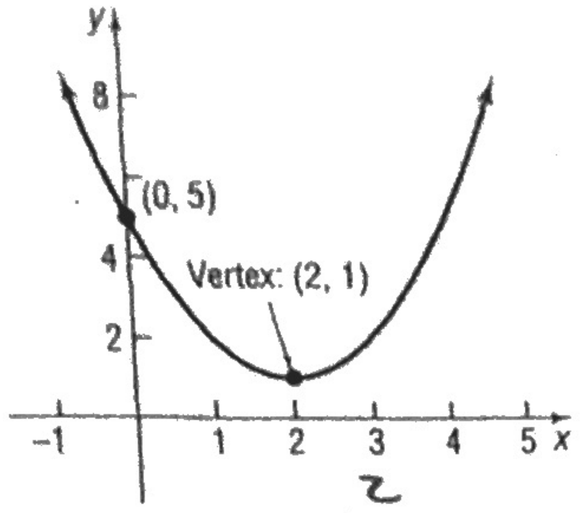
Give the equation of each graphed function.

9.

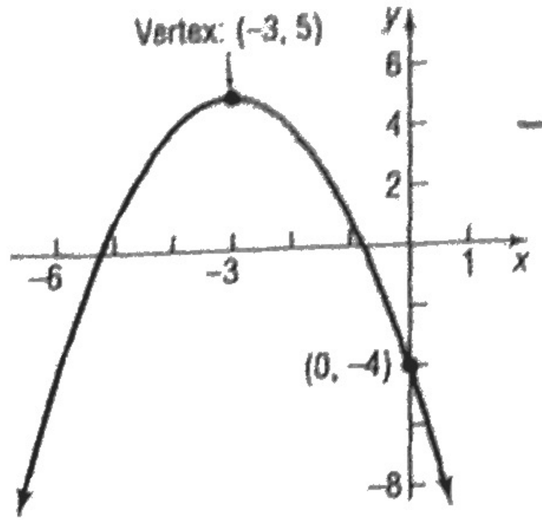


2

$y = a(x-2)+1$
$5 = a(0-2)^2+1$
$5 = 4a+1$ $a=1$

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

10.



$y = a(x+3)^2+5$
$-4 = a(0+3)^2+5$
$-4 = a \cdot 9 + 5$
$-9 = 9a$
$-1 = a$

$f(x) = -(x+3)^2+5$

11. The function $H(x) = -3.24x^2 + 242.1x - 738.4$ models the number of individuals whose age is x and who engage in hunting activities. (graph on calculator)

a. What is the age at which there are the most hunters? Approximately how many hunters are at this age?

$x \approx 37.4$ yrs. old $\quad y \approx 3784$ hunters

b. Are the number of hunters increasing or decreasing for individuals who ~~are between 40 and 45 years of age~~?

Decreasing

12. The daily revenue R achieved by selling x boxes of candy is modeled by $R(x) = 9.5x - 0.04x^2$. The daily cost C of selling x boxes of candy is $C(x) = 1.25x + 250$.

a. How many boxes of candy must the firm sell to maximize revenue? What is the maximum revenue?

≈ 119 boxes $\quad \$564.06$

b. Profit is given as $P(x) = R(x) - C(x)$. What is the profit function?

$P(x) = -0.04x^2 + 8.25x - 250$

c. How many boxes of candy must the firm sell to maximize profit? What is the maximum profit?

(graph on calc.)

≈ 103 boxes $\quad \$175.39$

d. Provide a reasonable *explanation* as to why the answers found in parts ***a*** and ***c*** differ.

Maximizing revenue does not mean profits will be maximized because the time needed to sell 16 more boxes may increase the cost of paying employees, therefor decreasing profit margins.

e. *Explain* why a quadratic function is a reasonable model for revenue.

It makes sense that the more boxes you sell, the greater income(revenue) you will have. However, there will be a maximum to the revenue since it depends on the demand of customers which is never infinite.