

Write the vertex form of each parabola.

$$y = x^2 - 4x + 11$$

$$y = x^2 + 10x + 12$$

$$y = 2x^2 + 24x + 47$$

NUMBER THEORY The product of two consecutive even integers is 728. Find the integers.

BUSINESS Jaime owns a business making decorative boxes to store jewelry, mementos, and other valuables.

The function $y = x^2 + 50x + 1800$ models the profit y that Jaime has made in month x for the first two years of his business.

a. Write an equation representing the month in which Jaime's profit is \$2400.

b. Use completing the square to find out in which month Jaime's profit is \$2400.

PHYSICS From a height of 256 feet above a lake on a cliff, Mikaela throws a rock out over the lake. The height H of the rock t seconds after Mikaela throws it is represented by the equation $H = -16t^2 + 32t + 256$. To the nearest tenth of a second, how long does it take the rock to reach the lake below? (*Hint:* Replace H with 0.)