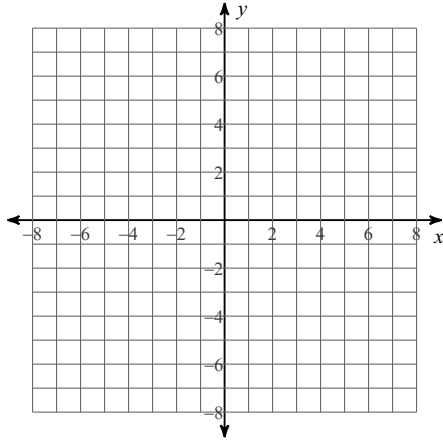


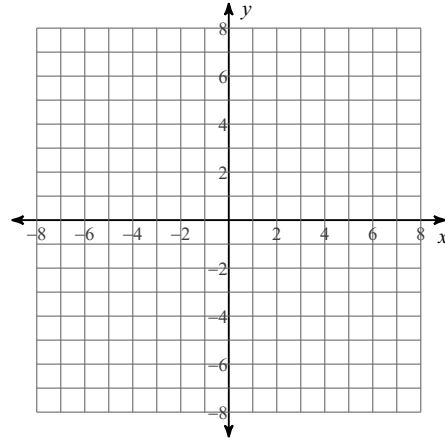
# Quad Applications Review

**Graph each quadratic inequality. List all key features.**

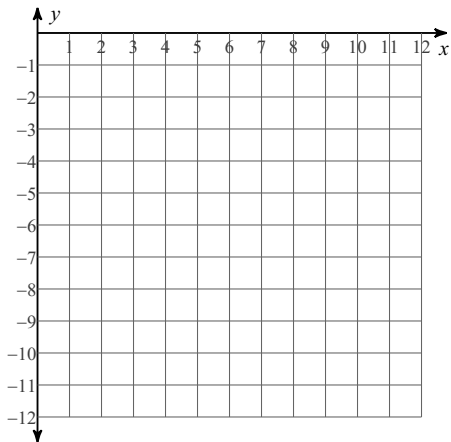
1)  $y \geq -(x - 1)^2 + 3$



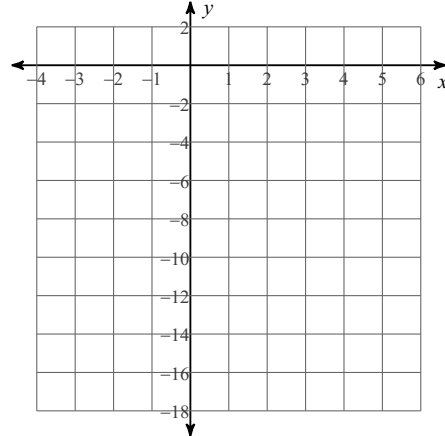
2)  $y < -x^2 - 4x - 4$



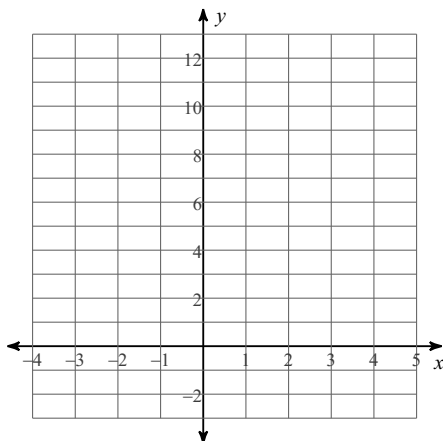
3)  $y \leq -2(x - 3)^2 - 3$



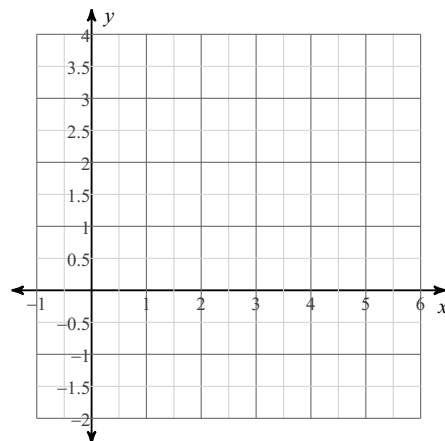
4)  $y < 3(x - 1)(x + 3)$



5)  $y \leq -(x + 3)(x - 1)$



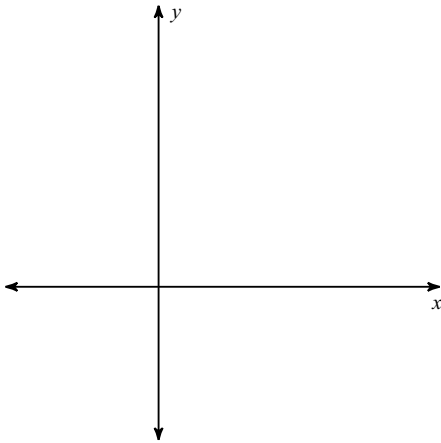
6)  $y > x^2 - 8x + 17$



**A ball is thrown straight up, from 3m above the ground. The balls height,  $h$ , is given by the formula  $h = 3 + 14t - 5t^2$ , where  $t$  is measured in seconds after the ball is thrown. Afte how many seconds does it hit the ground?**

7) Make a graph of the situation.

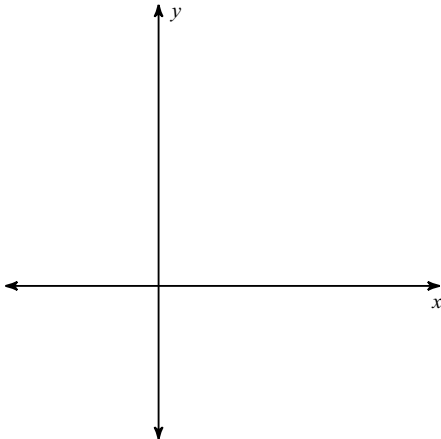
8) How high will the ball go?



9) How far far will the ball travel?

**A ball is tossed in the air from ground level. After  $t$  seconds it reaches a height of  $h$  given by the equation  $h = 144t - 16t^2$ .**

10) Make a graph of the situation.



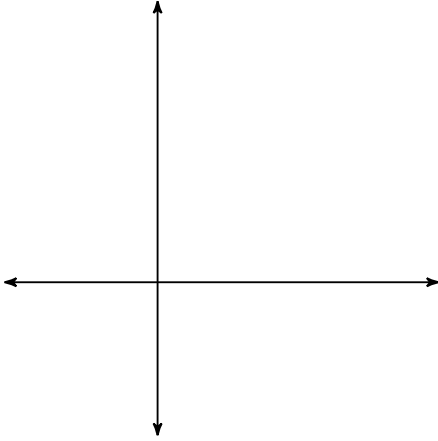
11) What is the height after 3 seconds?

12) What is the maximum height the ball will reach?

13) After how many seconds will the ball hit the ground?

A rocket carrying fireworks is launched from a hill 80 feet above the lake. The rocket will fall into the lake after exploding at its maximum height. The rocket's height above the surface is given by  $h = -16t^2 + 64t + 80$ .

14) Make a graph of the situation.



15) At what height does the rocket start?

16) How high is the rocket after 1.5 seconds?

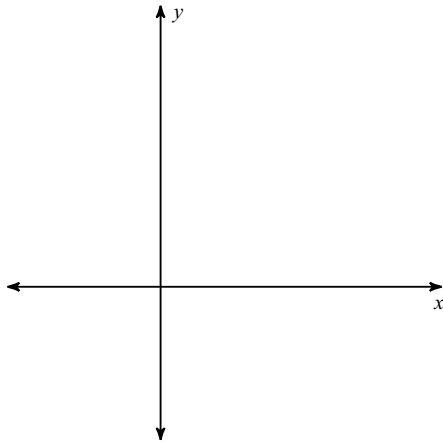
17) At what height will the rocket explode?

18) After how many seconds will the rocket hit the lake?

A certain company's main source of income is selling ear buds.

The company's annual profit is modeled by:  $P = -4x^2 + 24x - 28$ , where  $P$  is the profit (in thousands of dollars), and  $x$  is the price of a bracelet (in dollars).

19) Make a graph of the situation.



20) What price should the company set each set of ear buds at to earn the maximum profit?

21) What is the maximum profit the company can earn?

22) What price(s) for the ear buds, would the company have a profit of zero?

23) What is the profit made when selling the bracelets for \$3.50 each?