

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1. Solve each equation by **factoring**.

a) $x^2 + 8x = -15$

b) $100x^2 = 121$

c) $7x^2 - 2x = 0$

d) $3x^2 - 16x - 12 = 0$

e) $5x^2 - 44x + 120 = -30 + 11x$

f) $2x(x - 3) = 20$

2. Algebraically determine the EXACT roots of the equation: $4x^2 + 4x - 5 = 0$
Simplify completely.

3. Using calculations, how many times does the graph of each equation cross the x - axis?

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

b) $y = 9x^2 - 6x + 1$

c) $y = 5x^2 + 7x + 3$

4. Two integers differ by 4. The sum of their squares is 58. Write a quadratic equation to represent this situation and determine the two numbers.

5. Given the standard form of the quadratic function,

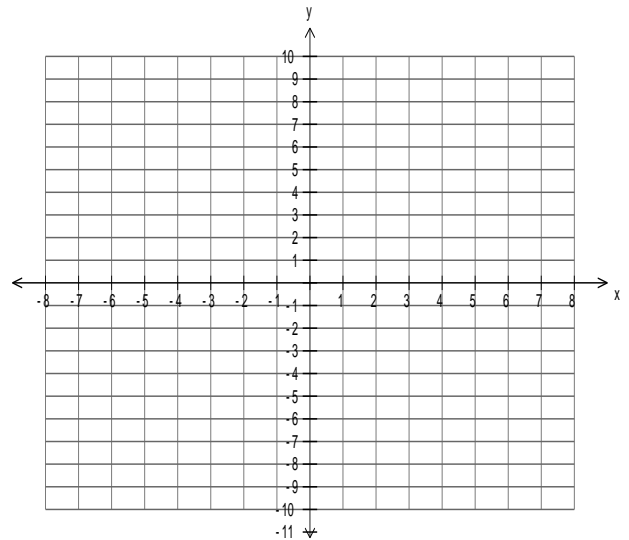
$$y = 2x^2 + 10x + 8, \text{ determine the}$$

d) sketch the graph

a) vertex

b) y-intercept

c) x-intercept(s)



6. A photo framer wants to place a mat of uniform width all around a photo. The dimensions of the photo are 11 in. by 14 in. If the total area of the mat and photo is 300 in^2 , what is the width of the mat?

7. The length of one leg of a right triangle is 3 more than the other leg. If the hypotenuse is 15 m, what is the length of the shortest leg?

8. A ball is thrown into the air from a bridge that is 15 m above a river. The function of the height, $h(t)$, in meters, of the ball over time, t , in seconds, is $h(t) = -4.9t^2 + 9t + 15$. When is the ball 17 m above the water?