

Section 3.3 Real Roots of Quadratic Equations

1. True or False.

a) The value of the discriminant is

$$D = -b \pm \sqrt{c^2 - 4ab}.$$

b) If $D > 0$, there are no real roots.

c) If $D < 0$, there are two real roots.

d) If $D = 0$, there is one real root.

2. Given each value, D , for the discriminant, identify the number of real roots of the quadratic equation.

a) $D = 5$

b) $D = -2$

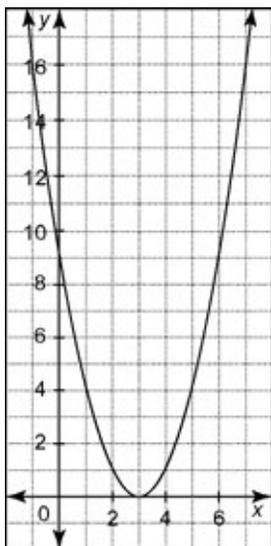
c) $D = 0$

d) $D = -1.4$

e) $D = \frac{7}{2}$

f) $D = (-6)^2 - 4(3)(-3)$

3. Which statement best describes the quadratic function?



- A The discriminant is greater than 0. There is one real root.
- B The discriminant is less than 0. There are two real roots.
- C The discriminant is 0. There are no real roots.
- D The discriminant is 0. There is one real root.

4. Determine the number of real roots for each equation.

a) $x^2 + 2x + 1 = 0$

b) $3x^2 + x + 5 = 0$

c) $-4x^2 - 5x + 9 = 0$

d) $x^2 + 3x + 10 = 0$

e) $7x^2 + 6x - 4 = 0$

f) $-2x^2 + 8x - 8 = 0$

5. Find the roots of each equation by factoring.

a) $6x^2 + 3x - 3 = 0$

b) $-x^2 - 4x + 21 = 0$

c) $4x^2 = -5x + 6$

d) $-20x + 24 = -4x^2$

e) $-30x^2 = 20x$

f) $7x^2 - 6 = -x$

6. Graph each function and identify the x -intercepts, if they exist.

a) $y = x^2 + x - 6$

b) $y = -x^2 - 1$

c) $y = 2x^2 - 2x - 4$

7. Solve for x by factoring.

a) $15 = \frac{x^2}{2} - \frac{x}{2}$

b) $3.5x^2 = 7x + 10.5$

8. Tomasz wants to build a rectangular playpen with an area of 20 m^2 and a perimeter of 16 m .

- a) Write a quadratic equation for the area of the playpen that uses the width, w , as the unknown variable.
- b) What is the discriminant of the quadratic equation?
- c) Can Tomasz build a playpen with these constraints?
- d) Suppose Tomasz changes the required perimeter to 18 m . What are the dimensions of the new playpen?