

Unit 5 Part 1

Lesson 8

Solving Quadratics by Graphing

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Foundations of Math 2
Unit 6 - Solving and Graphing Quadratic Equations
Lesson 3 → Solving a Quadratic Equation by Graphing

Name: _____

Date: _____ Pd: _____

Definition: A **quadratic equation** is an equation that can be written in the standard form $ax^2 + bx + c$, where a , b , and c are real numbers and $a \neq 0$. The solutions of a quadratic equation are called its **roots** or **zeros**.

The need for finding the roots of a quadratic equation may occur in different situations:

- finding the **roots** of an equation.
- finding the **x-intercepts** of the graph.
- finding the **zeros** of the function.
- finding the **points of intersection of the graph and the x-axis.**

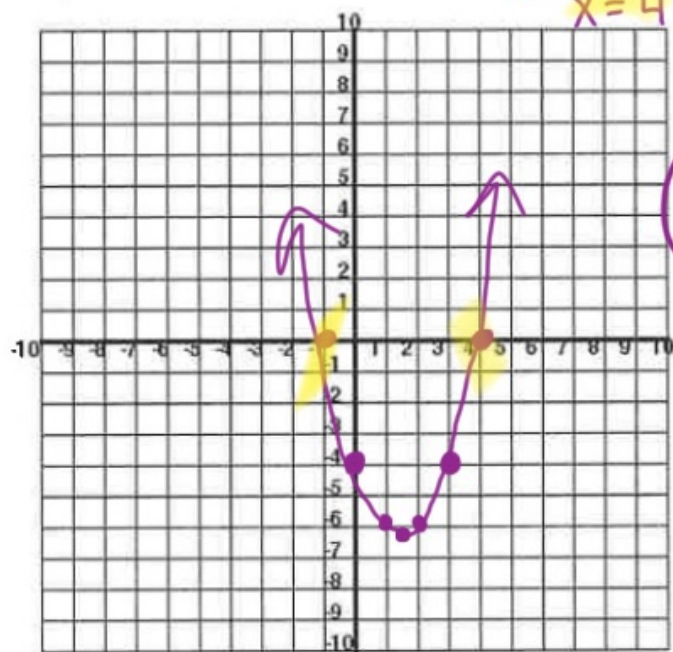
1. Solve by graphing a related function. (Sketch the graph and label the solutions.)

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a) $x^2 - 3x - 4 = 0$

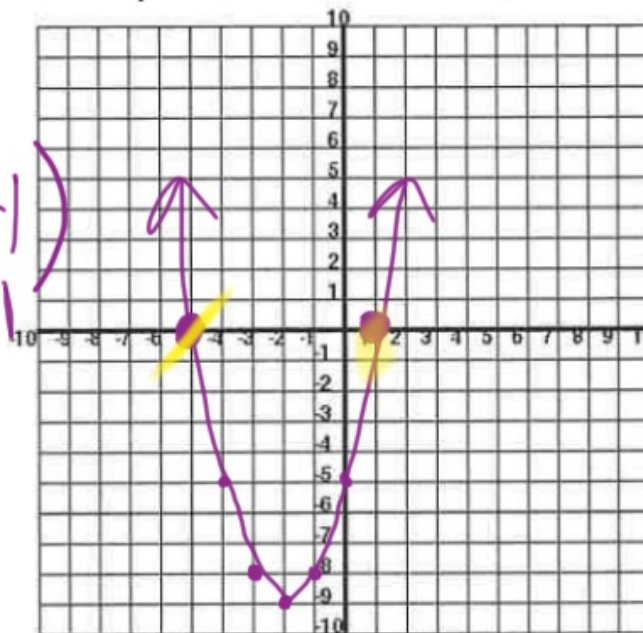
$(x-4)(x+1) = 0$
 $x=4 \quad x=-1$



$x = \underline{4 \text{ and } -1}$

b) $x^2 + 4x - 5 = 0$

$(x+5)(x-1) = 0$
 $x=-5 \quad x=1$



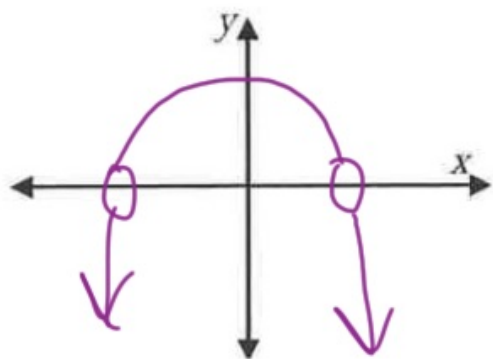
$x = \underline{-5, 1}$

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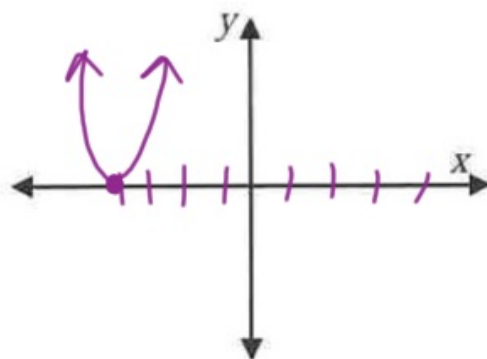


2. Using the accompanying grids, sketch graphs of functions that satisfy the given criteria.

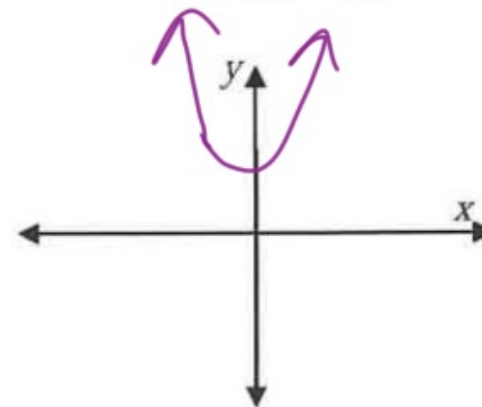
a) $ax^2 + bx + c = 0$
2 Real Roots



(b) $ax^2 + bx + c = 0$
1 Real Root



(c) $ax^2 + bx + c = 0$
0 Real Roots



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Fact: A quadratic equation can have 0, 1, or 2 real solutions

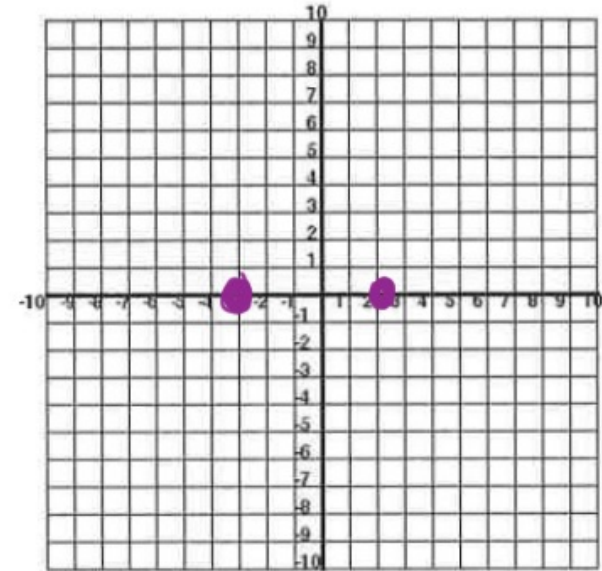
3. Sketch the following related functions and find the zeros of the functions.

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

$(x+3)(x-2) = 0$ $x = -3$
 $x = 2$

State the roots of the equation.

$x = -3, 2$



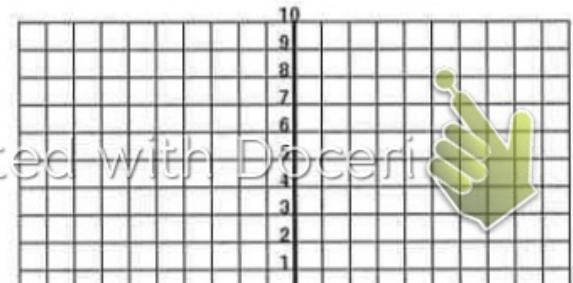
How many REAL roots are there to the equation?

2

b) $x^2 - 2x + 1 = 0$ $(x-1)(x-1)$

State the roots of the equation.

$x = 1$



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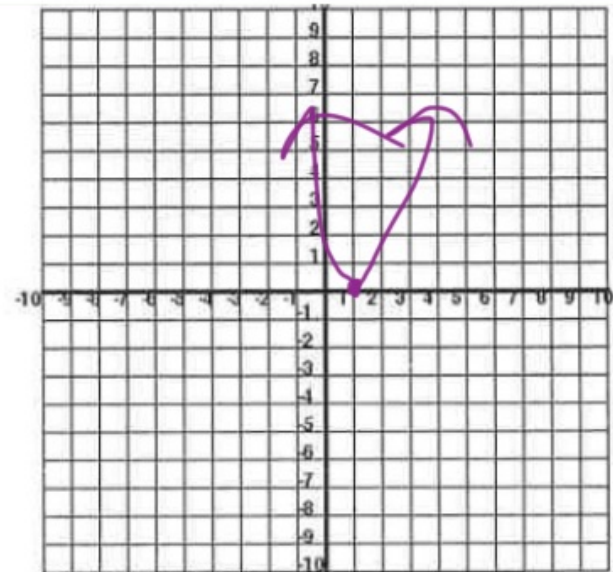
b) $x^2 - 2x + 1 = 0$

$x = 1$

State the roots of the equation.

$x =$ _____

How many REAL roots are there to the equation?

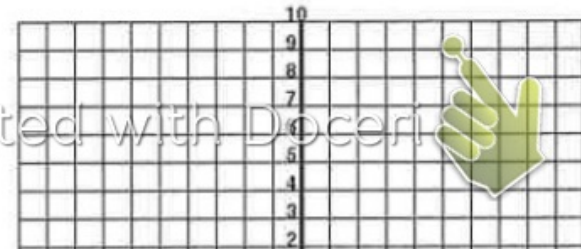


c) $x^2 + 10x + 26 = 0$

A M

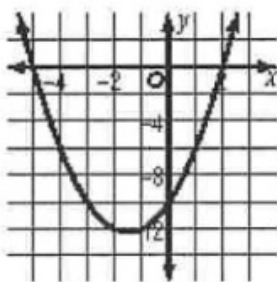
State the roots of the equation.

None (real)

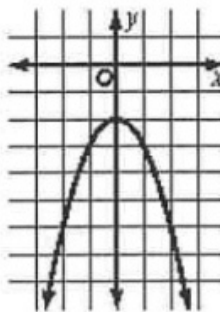


State the real roots of each quadratic equation whose related function is graphed below.

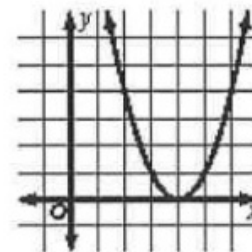
1.



2.



3.



4. The real roots of a quadratic equation correspond to the ___?___ of the graph of the related function.

A. x-intercepts

B. y-intercepts

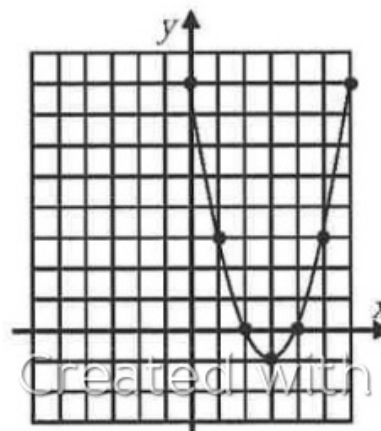
C. vertex

D. maximum

5. The graph of $y = x^2 - 6x + 8$ is shown.

The roots of the equation $x^2 - 6x + 8 = 0$

are $x = \underline{\hspace{2cm}}$.

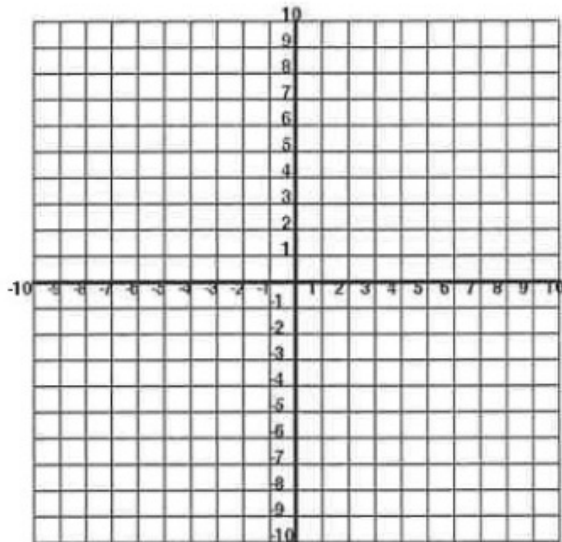


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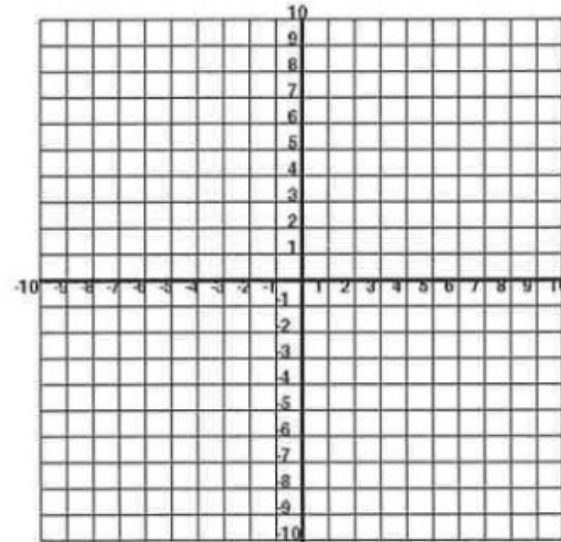
6. Find the roots of each of the following equations by graphing the related function.

a) $3x^2 - 15x - 18 = 0$



$x =$ _____

b) $x^2 + 8x + 16 = 0$



$x =$ _____

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Classwork

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