



Unit 2: Quadratic Functions Lesson 2.3

Coach's Corner - V

1. Use the graphs provided to determine the number of solutions each of the following equations will have.

a. $4x^2 - 28x + 49 = 0$

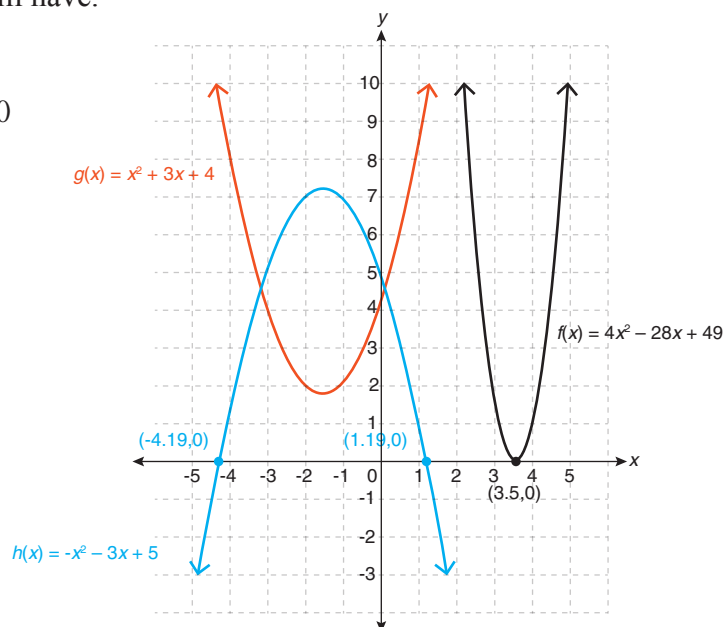
1 solution

b. $x^2 + 3x + 4 = 0$

no solution

c. $-x^2 - 3x + 5 = 0$

2 solutions



The number of x -intercepts of the graphs of the quadratic functions indicates the number of solutions to the corresponding quadratic equations.

2. Determine the solutions to the equations in 1.

The solution(s) to the equations are the x -intercept(s) of the graphs of the corresponding functions.

a. $x = 3.5$

b. no solution

c. $x = -4.19, 1.19$

3. Solve the following equations by factoring. Verify the solutions.

a. $x^2 - 4 = 0$

This can be factored as a difference of squares.

$$\begin{aligned} x^2 - 4 &= 0 \\ (x - 2)(x + 2) &= 0 \\ x - 2 &= 0 & x + 2 &= 0 \\ x &= 2 & x &= -2 \end{aligned}$$

Left Side	Right Side	Left Side	Right Side
$x^2 - 4$	0	$x^2 - 4$	0
$(2)^2 - 4$		$(-2)^2 - 4$	
$4 - 4$		$4 - 4$	
0		0	

b. $x^2 = 5x$

$$\begin{aligned} x^2 - 5x &= 0 \\ x(x - 5) &= 0 \\ x &= 0 & x - 5 &= 0 \\ & & x &= 5 \end{aligned}$$

Left Side	Right Side	Left Side	Right Side
x^2	$5x$	x^2	$5x$
0^2	$5(0)$	5^2	$5(5)$
0	0	25	25

c. $16x = -x^2 - 63$

$$\begin{aligned} x^2 + 16x + 63 &= 0 \\ (x + 7)(x + 9) &= 0 \\ x + 7 &= 0 & x + 9 &= 0 \\ x &= -7 & x &= -9 \end{aligned}$$

Left Side	Right Side	Left Side	Right Side
$16x$	$-x^2 - 63$	$16x$	$-x^2 - 63$
$16(-7)$	$-(-7)^2 - 63$	$16(-9)$	$-(-9)^2 - 63$
-112	-112	-144	-144

d. $5x^2 - x - 4 = 0$

$5x^2 - x - 4 = 0$
 $5x^2 - 5x + 4x - 4 = 0$
 $(5x^2 - 5x) + (4x - 4) = 0$
 $5x(x - 1) + 4(x - 1) = 0$
 $(x - 1)(5x + 4) = 0$
 $x - 1 = 0$ $5x + 4 = 0$
 $x = 1$ $5x = -4$
 $x = -\frac{4}{5}$

Left Side	Right Side	Left Side	Right Side
$5x^2 - x - 4$	0	$5x^2 - x - 4$	0
$5(1)^2 - 1 - 4$		$5\left(-\frac{4}{5}\right)^2 - \left(-\frac{4}{5}\right) - 4$	
0		0	