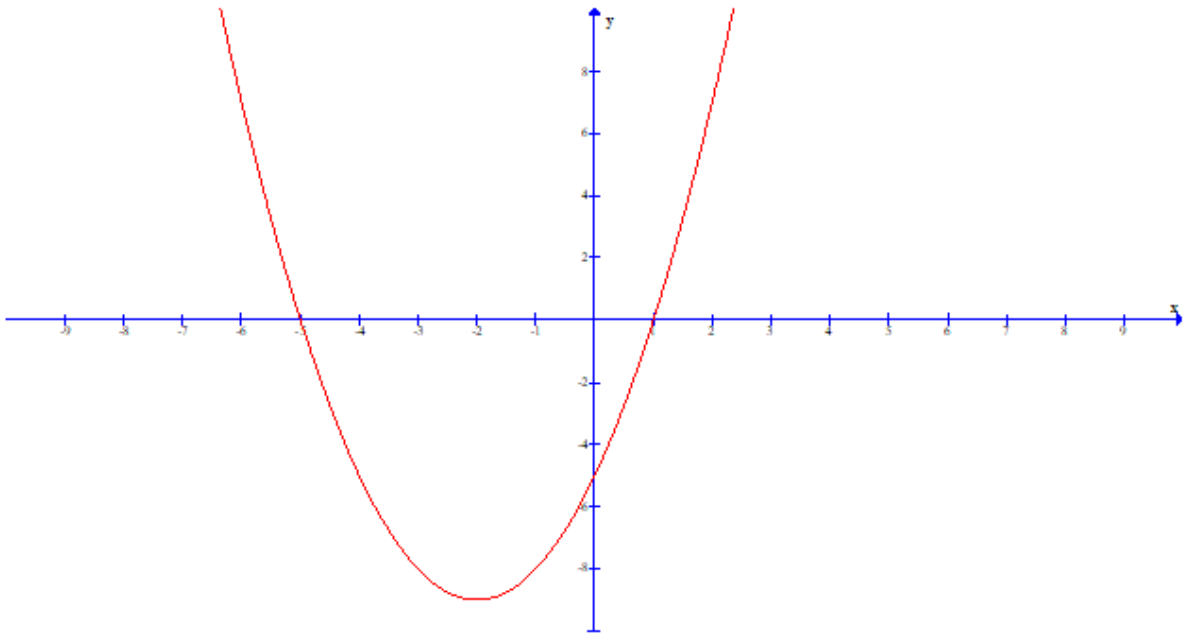# Solving Quadratic Equations By Graphing

Practice Questions

1. What are the solutions to the quadratic equation, $x^2 + 4x - 5 = 0$, shown as a parabola on the graph below?

2. There are 2 solutions to the quadratic equation, $2x^2 + 7x - 4 = 0$. What is the value of the solution which is not an integer?

3. Solve $20w^2 - 23w - 8 = -14$.

4. On the graph below, two parabolas are shown. Parabola A opens up and Parabola B opens down. Which solution is common to both quadratic equations?
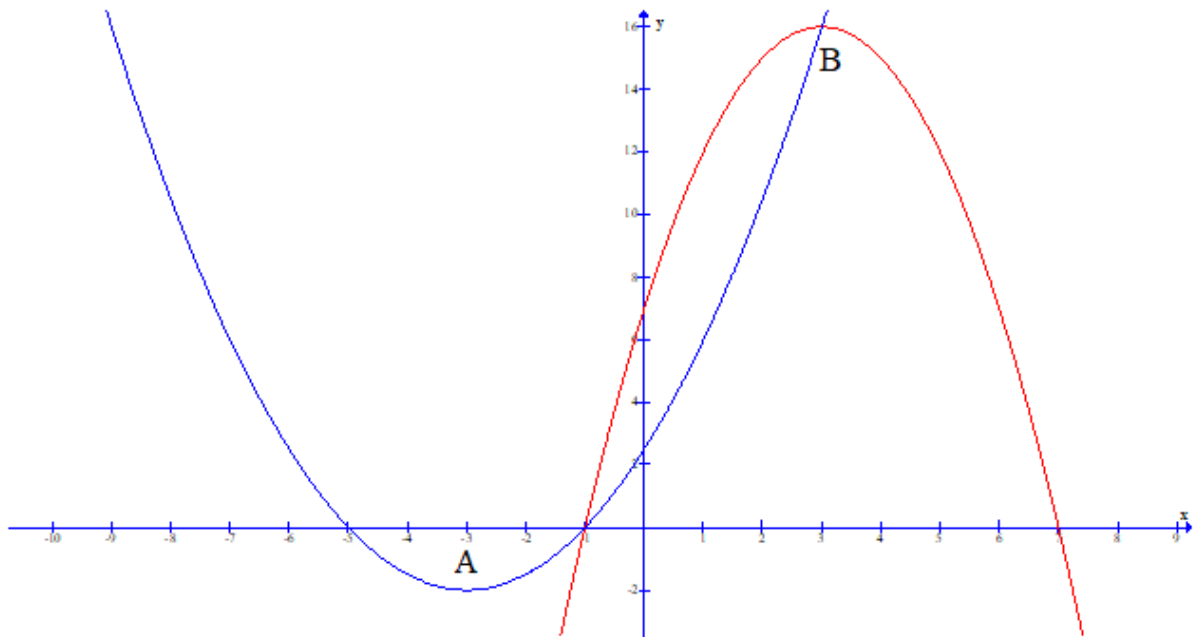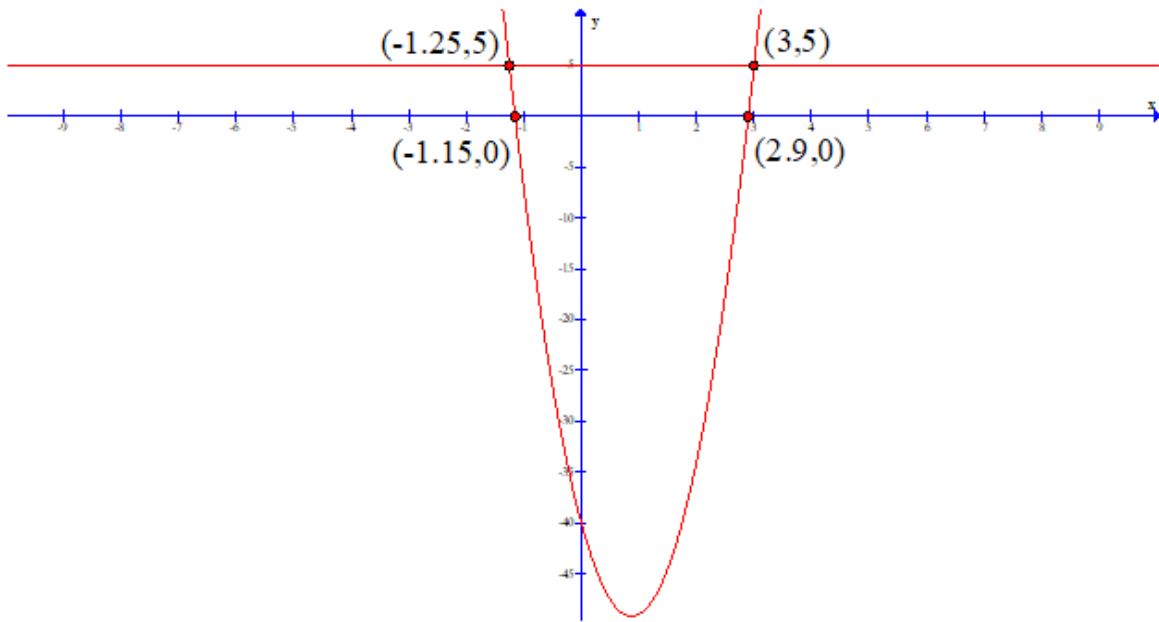

5. Given the quadratic equation, $4x^2 - 42x + k = 0$, where **k** is an integer, one solution is 10. Determine the value of **k**.

6. On your graphing calculator, suppose you typed:
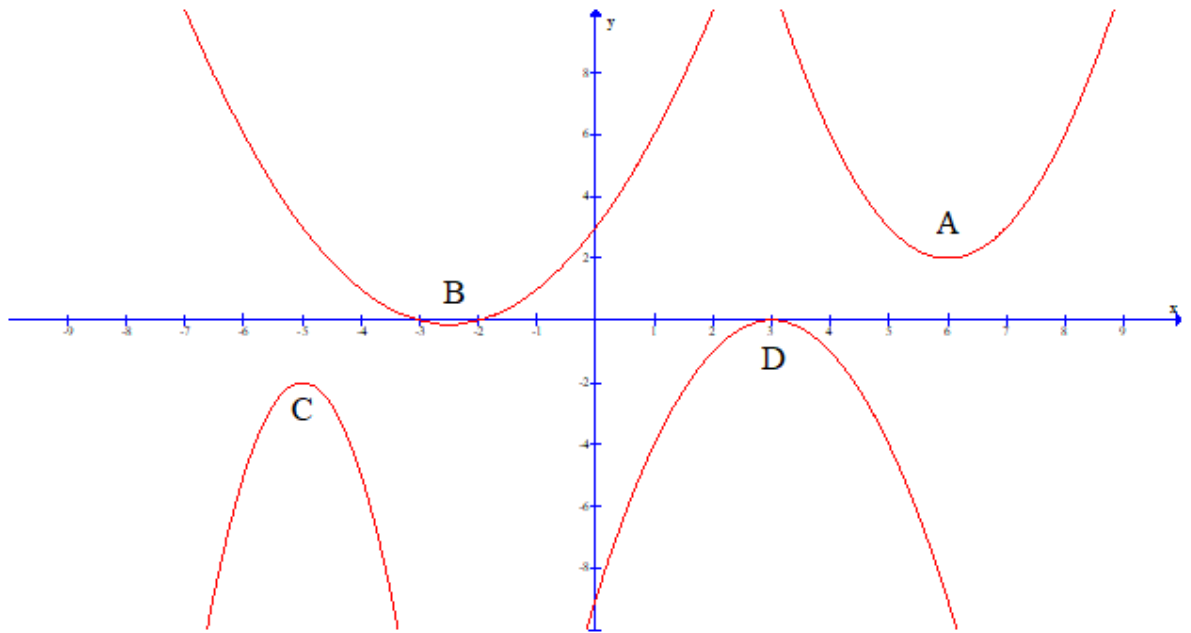
    $y_1 = 12x^2 - 21x - 40$, and

    $y_2 = 5$,

    which would produce the graph below.

(-1.25,5)   (3,5)

(-1.15,0)   (2.9,0)

What are the solutions to $12x^2 - 21x - 45 = 0$?

7. The quadratic equation $-2v^2 + 2v = -12$ has two integer solutions. What is the **sum** of these two integers?

8. Based on the graphs below, fill in the blank with the correct answer.

a) Which graph(s) has one solution?   ____
b) Which graph(s) has two solutions?   ____
c) Which graph(s) has no solutions?   ____
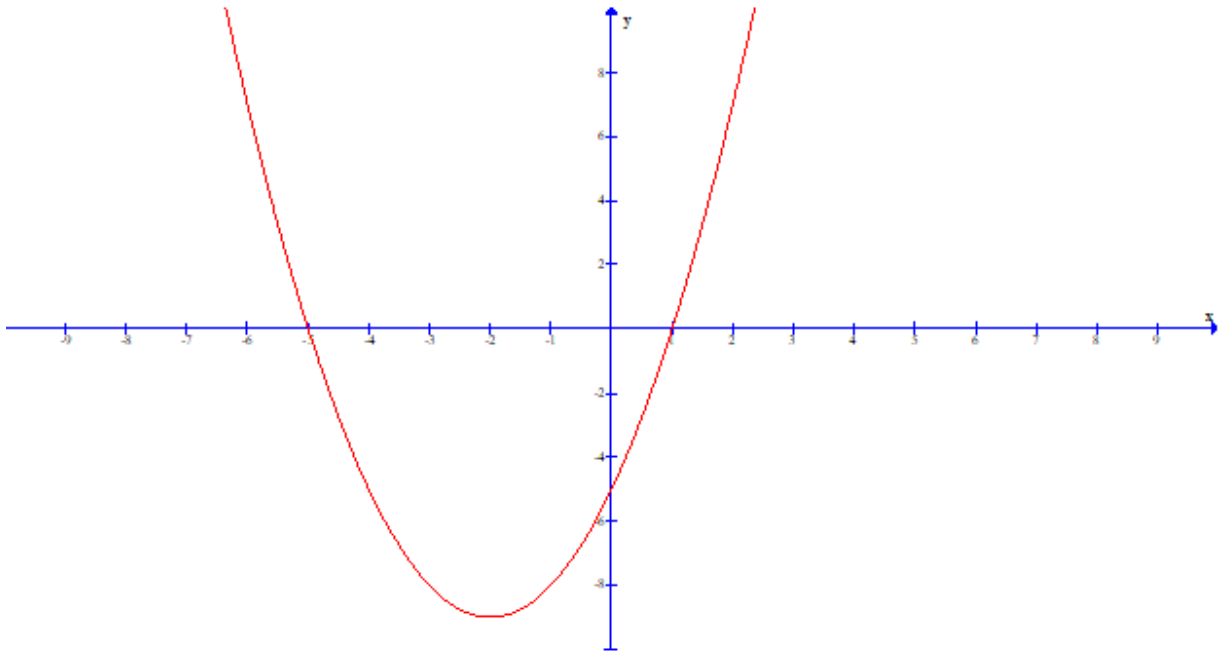d) How many graphs have at least one solution? ____

9. What are the solutions to $7x^2 = 21x$?

10. One solution to the quadratic equation, $x^2 + 19x + k = 0$, where **k** is an integer, is -8. What is the other solution?

Solving Quadratic Equations By Graphing

Practice Questions Answers

1. What are the solutions to the quadratic equation, $x^2 + 4x - 5 = 0$, shown as a parabola on the graph below?


The solutions to a quadratic equation are equivalent to determining the x-intercepts. The x-intercepts of the above graph are -5 and 1. Thus, the solutions are -5 and 1.

2. There are 2 solutions to the quadratic equation, $2x^2 + 7x - 4 = 0$. What is the value of the solution which is not an integer?

To solve this quadratic equation, graph and determine the x-intercepts using the zero function on the graphing calculator. [NOTE: solutions, x-intercepts, zeroes and roots all mean the same.]
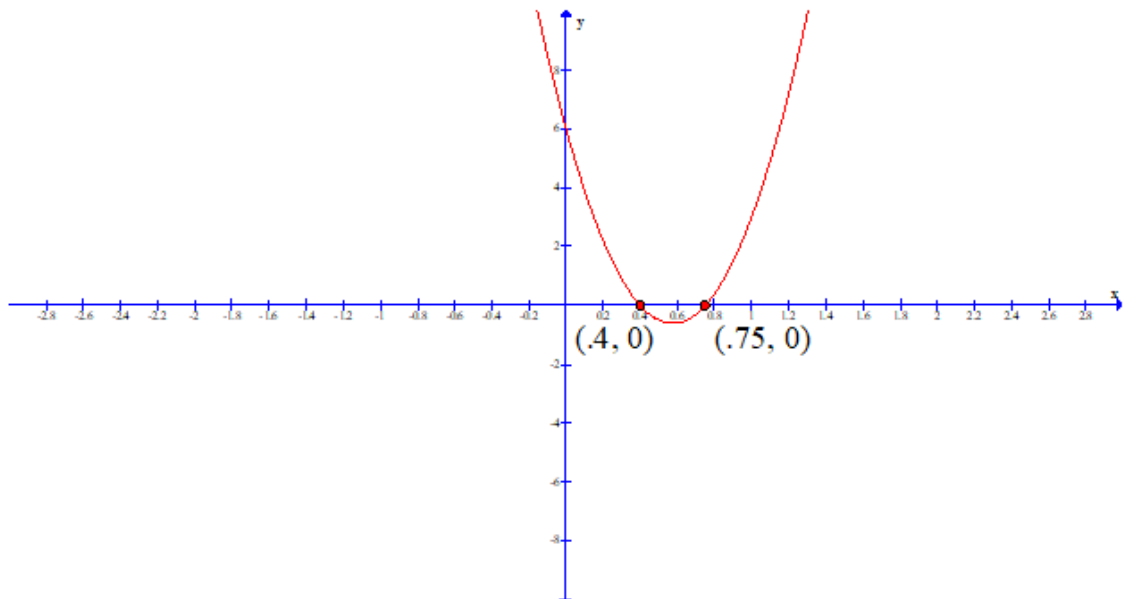
As seen in the graph below, the x-intercepts are -4 and $\frac{1}{2}$. Of these two solutions, the non-integer is $\frac{1}{2}$.
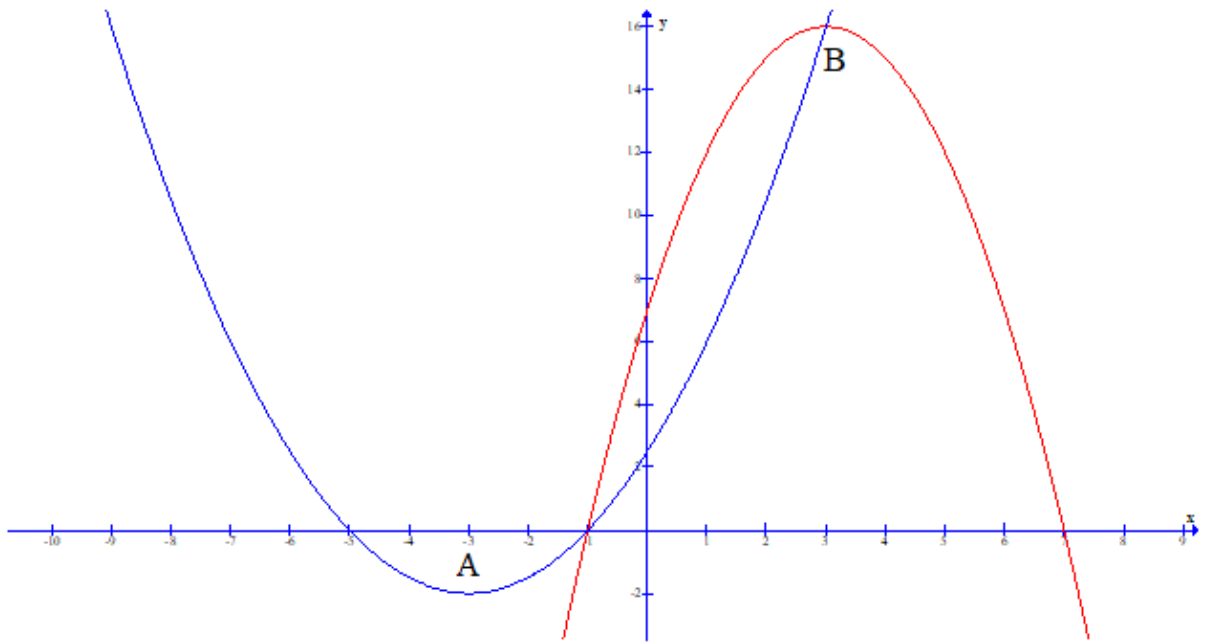
The graph shows a parabola with x-intercepts labeled $(-4, 0)$ and $(\frac{1}{2}, 0)$.
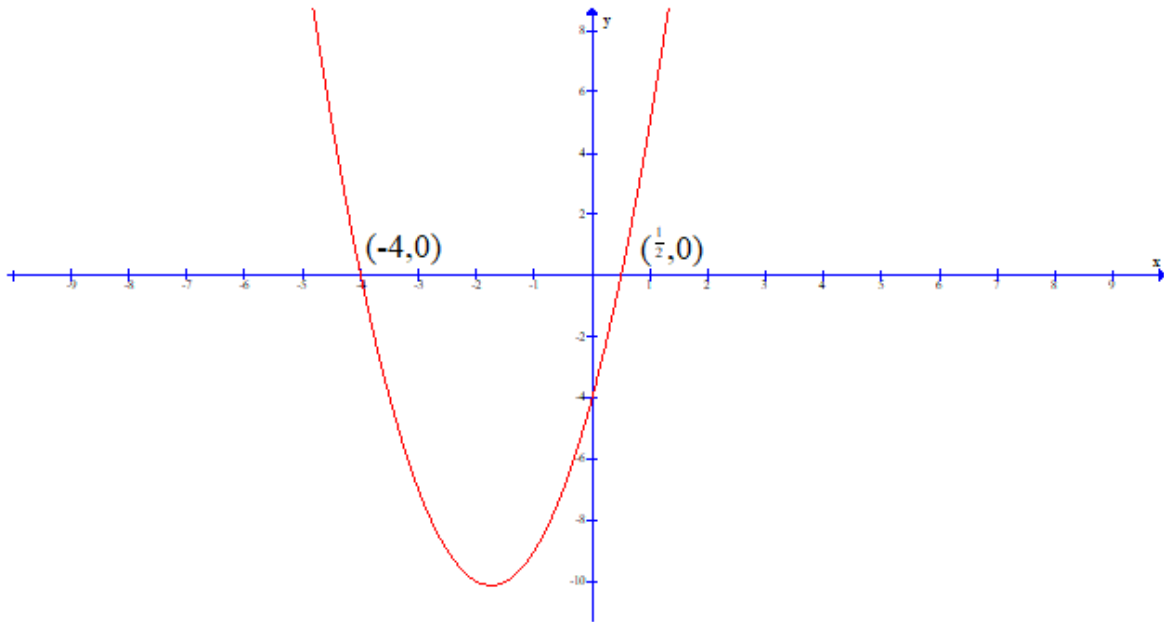
3. Solve $20w^2 - 23w - 8 = -14$.

Begin by setting the equation equal to zero.
$20w^2 - 23w + 6 = 0$

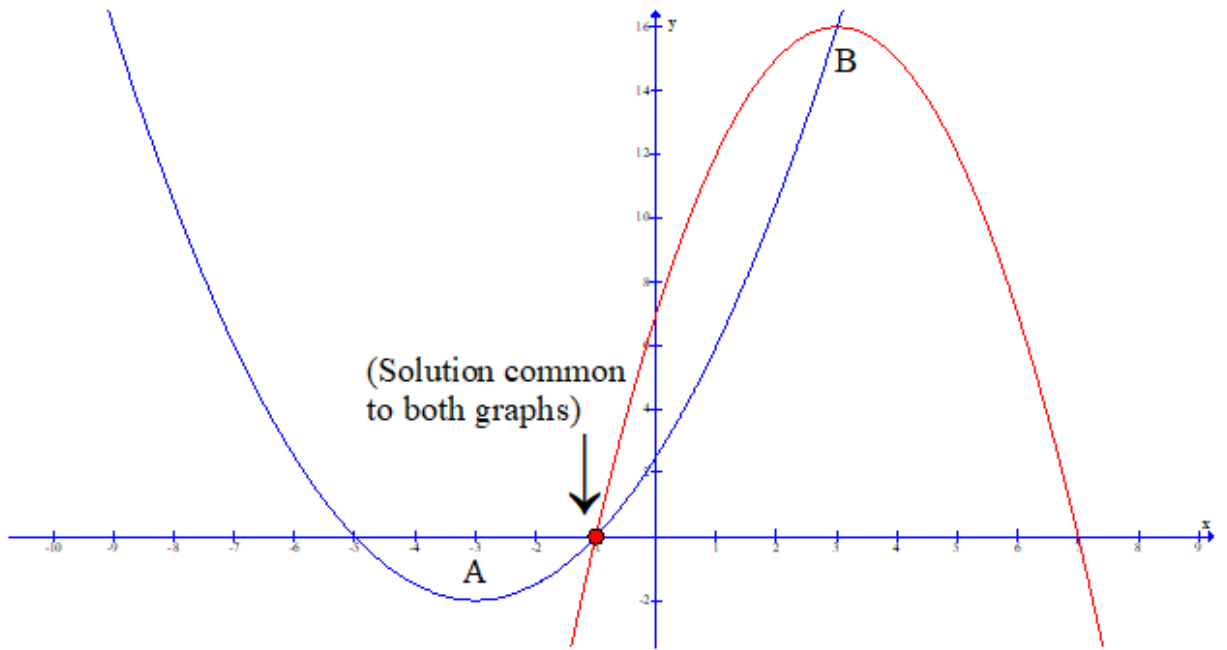The graph shows a parabola with x-intercepts labeled $(.4, 0)$ and $(.75, 0)$.

4. On the graph below, two parabolas are shown. Parabola A opens up and Parabola B opens down. Which solution is common to both quadratic equations?

The solution common to both graphs is -1, as shown in the graph below.

(Solution common to both graphs)

A

B

5. Given the quadratic equation, $4x^2 - 42x + k = 0$, where **k** is an integer, one solution is 10. Determine the value of **k**.

A solution is a value, that when substituted into an equation, will make a true statement. Substitute (10) into the equation for (x).

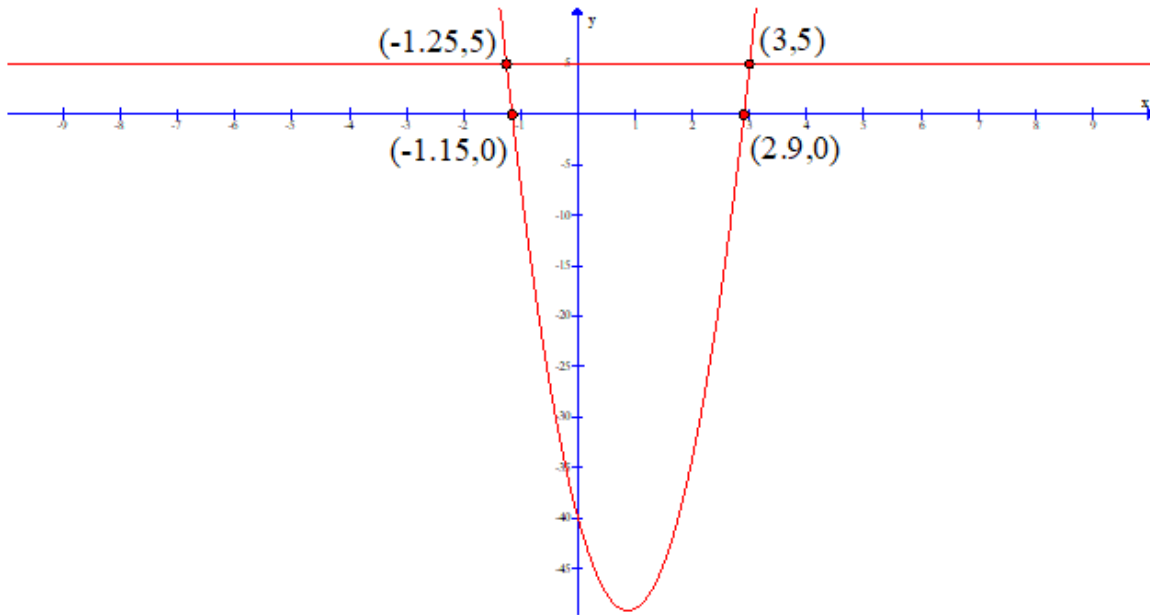$4(10)^2 - 42(10) + k = 0$

$400 - 420 + k = 0$

$-20 + k = 0$

$k = 20$

6. On your graphing calculator, suppose you typed:

$y_1 = 12x^2 - 21x - 40$, and

$y_2 = 5$,

which would produce the graph below.

What are the solutions to $12x^2 - 21x - 45 = 0$?

If 5 was added to both sides of the equal sign of $12x^2 - 21x - 45 = 0$, the equivalent would be $12x^2 - 21x - 40 = 5$

By Typing $y_1 = 12x^2 - 21x - 40$, and

$y_2 = 5$,

the solution would be the x-coordinate(s) of the intersection of the 2 graphs (which is shown in the question).
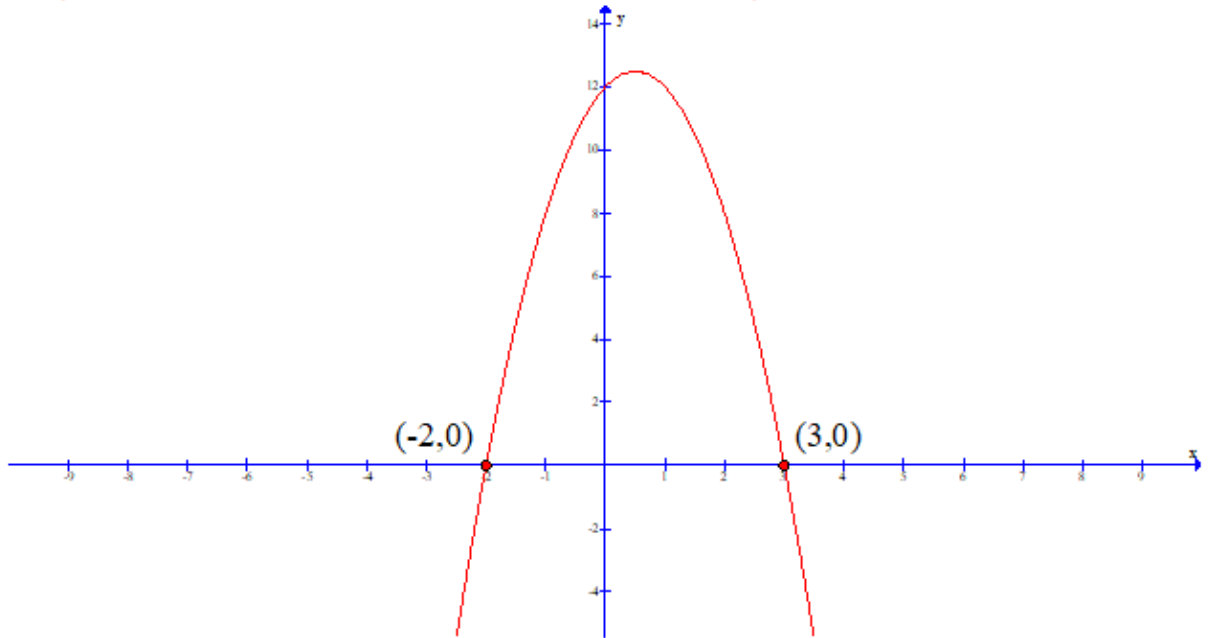
Thus, the solutions to $12x^2 - 21x - 45 = 0$, are -1.25 and 3.

7. The quadratic equation $-2v^2 + 2v = -12$ has two integer solutions. What is the **sum** of these two integers?

Begin by setting the equation equal to zero. Add 12 to both sides.
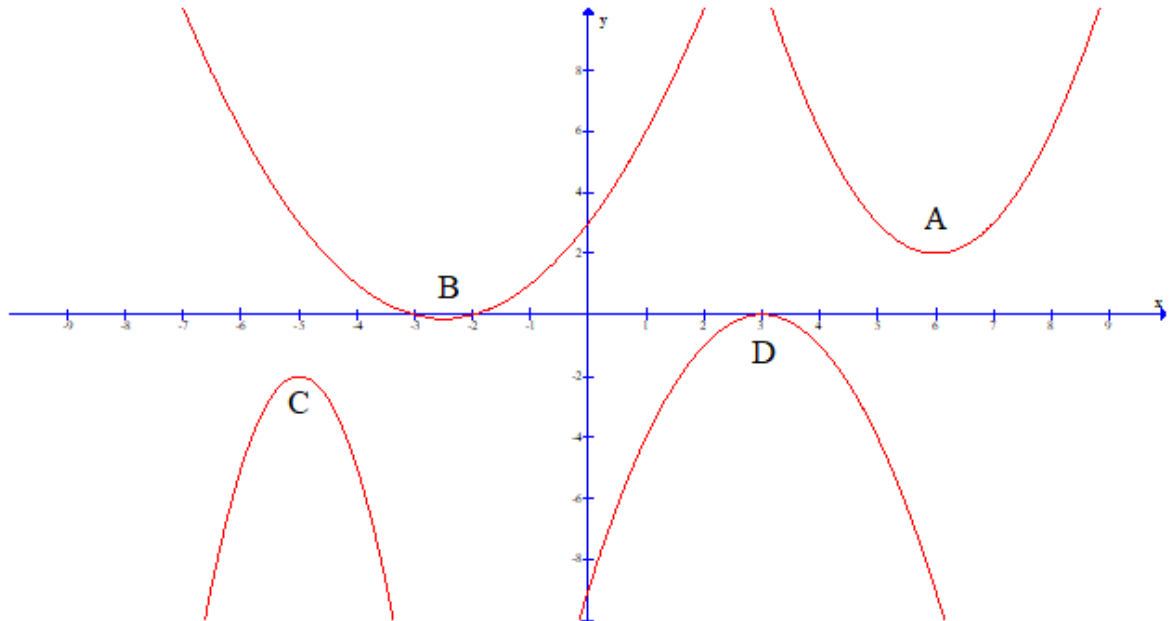
$-2v^2 + 2v + 12 = 0$.

Graph the quadratic equation and find the x-intercepts.

The solutions are the x-intercepts, -2 and 3. The sum of these 2 integers is

1.

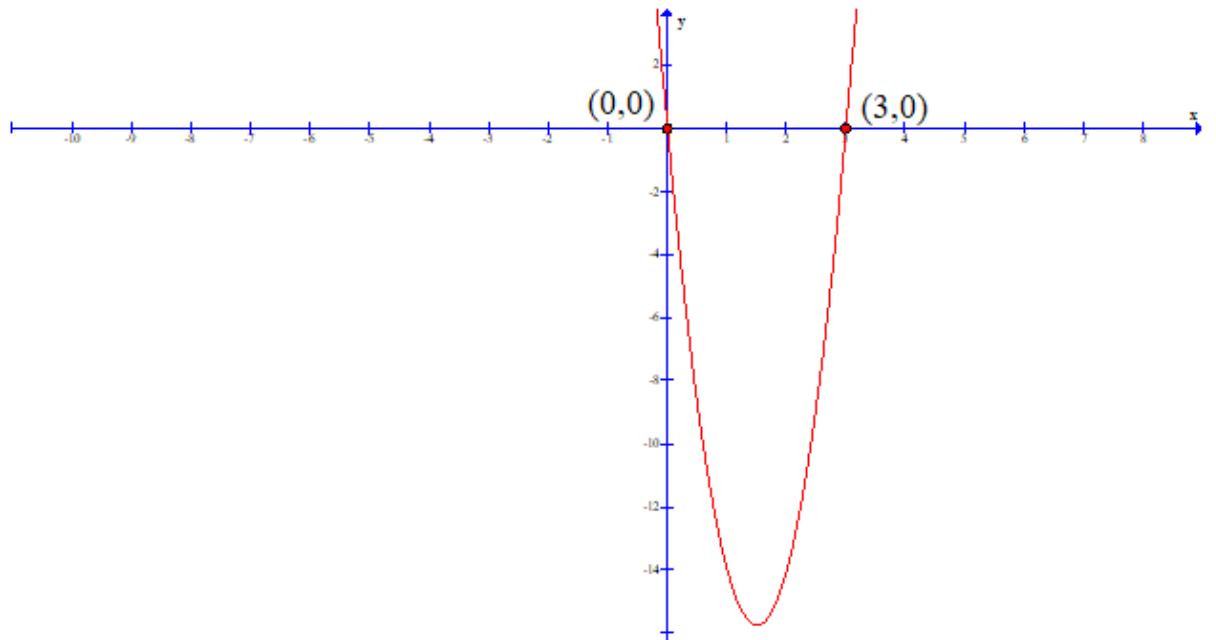8. Based on the graphs below, fill in the blank with the correct answer.

  e) Which graph(s) has one solution?   D

  f) Which graph(s) has two solutions?   B

  g) Which graph(s) has no solutions?   A and C

  h) How many graphs have at least one solution? 2 (B and D)

9. What are the solutions to $7x^2 = 21x$?

 First, set the equation equal to zero.

 $7x^2 – 21x = 0$

 Graph and find the x-intercepts.

The solutions are 0 and 3.

10. One solution to the quadratic equation, $x^2 + 19x + k = 0$, where **k** is an integer, is -8. What is the other solution?

Since -8 is a solution, it can be substituted into the equation to make a true statement. This will allow us to find the value of k.
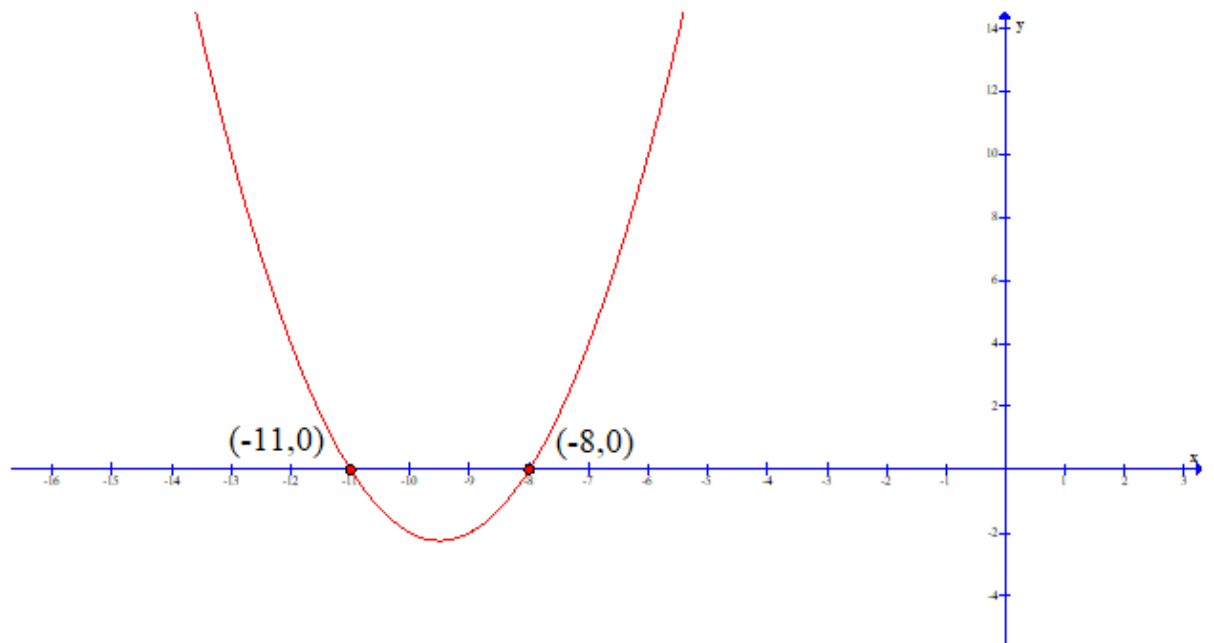
$(-8)^2 + 19(-8) + k = 0$

$64 + (-152) + k = 0$

$-88 + k = 0$

$k = 88$

Now graph the quadratic equation, $x^2 + 19x + 88 = 0$.

The other solution is -11.