Solving Quadratic Equations By Factoring Part 2

Practice Questions

1. Which of the following quadratic equations can be factored by the 'difference of squares' method?
   - $144 + y^2$
   - $36x^2 - 1$
   - $w^2 - w - 16$
   - $\frac{1}{4}x^2 - 49$
   - $x^3 - 100$

Solve the following 4 quadratic equations by factoring.

2. $x^2 - 121 = 0$

3. $\frac{1}{2}w^2 = \frac{9}{2}$

4. $2x^2 + 39x + 19 = 0$

5. $2 + 6v^2 + 7v = 5$

6. One root for the quadratic equation, $4x^2 + 27x = k$, where k is an integer, is -7. Find the other root.

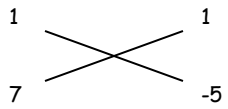
7. Given $4v^2 - 144 = 0$, find
   i) The largest root.
   ii) The sum of the roots.

8. If quadratic equation A is: $1 - 9x^2 = 0$, and quadratic equation B is: $3x^2 + 5x - 2 = 0$,
   what solution is common to both A and B?

9. The solutions to a quadratic equation are $x = \frac{-3}{5}$ and $x = \frac{-5}{2}$. When the quadratic equation is written in the form, $ax^2 + \mathbf{b}x + c = 0$, what is the value for **b**?

10. When Jim was asked to solve, $7x^2 - 34x - 5 = 0$, by factoring, he made some errors. Identify and correct all of his errors.

Step 1 Find the factors of 'a' and 'c'.



$7x^2 - 34x - 5 = 0$

Step 2 Write the factoring as two binomials, and read the numbers across.

$(x + 1)(7x - 5) = 0$

Step 3 State the solutions.

$x = 1$ and $x = \frac{5}{7}$

Solving Quadratic Equations By Factoring Part 2

Practice Questions Answers

1. Which of the following quadratic equations can be factored by the 'difference of squares' method?
   - $144 + y^2$ No
   - $36x^2 - 1$ Yes
   - $w^2 - w - 16$ No
   - $\frac{1}{4}x^2 - 49$ Yes
   - $x^3 - 100$ No

Solve the following 4 quadratic equations by factoring.

2. $x^2 - 121 = 0$

   $(x - 11)(x + 11) = 0$

   $x = 11$ and $x = -11$

3. $\frac{1}{2}w^2 = \frac{9}{2}$

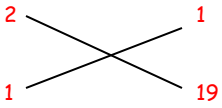
   Set the equation equal to zero, and divide out the common factor of $\frac{1}{2}$.

   $\frac{1}{2}(w^2 - 9) = 0$

   $\frac{1}{2}(w - 3)(w + 3) = 0$

   $w = 3$ and $w = -3$

4. $2x^2 + 39x + 19 = 0$



$2x^2 + 39x + 19 = 0$

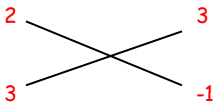
$(2x + 1)(x + 19) = 0$

$x = \frac{-1}{2}$ and $x = -19$

5. $2 + 6v^2 + 7v = 5$

Re-arrange the equation and set it equal to zero.

$6v^2 + 7v - 3 = 0$



$6v^2 + 7v - 3 = 0$

$(2v + 3)(3v - 1) = 0$

$V = \frac{-3}{2}$ and $v = \frac{1}{3}$

6. One root for the quadratic equation, $4x^2 + 27x = k$, where k is an integer, is -7. Find the other root.

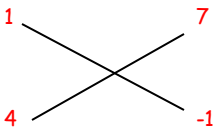
Since -7 is a root, or solution, it can be substituted into the equation to make a true statement. This fact allows us to find the value of k.

$4(-7)^2 + 27(-7) = k$

$196 - 189 = k$

$7 = k$

Now, factor the quadratic equation, $4x^2 + 27x - 7 = 0$



$4x^2 + 27x - 7 = 0$

$(x + 7)(4x - 1) = 0$

$x = -7$ and $x = \frac{1}{4}$

The other root is $\frac{1}{4}$.

7. Given $4v^2 - 144 = 0$, find
   i) The largest root.
   ii) The sum of the roots.

$4(v^2 - 36) = 0$

$4(v - 6)(v + 6) = 0$

The roots are 6 and -6.

The largest root is 6.

The sum of the roots is 0.

8. If quadratic equation A is: $1 - 9x^2 = 0$, and quadratic equation B is: $3x^2 + 5x - 2 = 0$,
   what solution is common to both A and B?

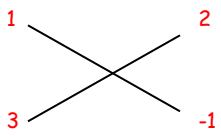
Factoring Quadratic Equation A: $(1 + 3x)(1 - 3x) = 0$

Either, $(1 + 3x) = 0$ or $(1 - 3x) = 0$

$3x = -1$ $\qquad$ $1 = 3x$

$x = \frac{-1}{3}$ $\qquad$ $x = \frac{1}{3}$

Factoring Quadratic Equation B:



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

$(x + 2)(3x - 1) = 0$

$x = -2$ and $x = \frac{1}{3}$

The solution common to both A and B is $\frac{1}{3}$.

9. The solutions to a quadratic equation are $x = \frac{-3}{5}$ and $x = \frac{-5}{2}$. When the quadratic equation is written in the form, $ax^2 + bx + c = 0$, what is the value for **b**?

Re-arrange $x = \frac{-3}{5}$ and $x = \frac{-5}{2}$, to set both equal to zero.

Multiply both sides by 5 $\qquad$ Multiply both side by 2

$5x = -3$ $\qquad$ $2x = -5$

Add 3 to both sides $\qquad$ Add 5 to both sides

$(5x + 3) = 0$ $\qquad$ $(2x + 5) = 0$

An equivalent form is: $(5x + 3)(2x + 5) = 0$

Using the box method to multiply these binomials:

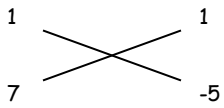
	5x	3
2x	$10x^2$	6x
5	25x	15

$(5x + 3)(2x + 5) = 10x^2 + 31x + 15$

The value of **b** is 31.

10. When Jim was asked to solve, $7x^2 - 34x - 5 = 0$, by factoring, he made some errors. Identify and correct all of his errors.

Step 1 Find the factors of 'a' and 'c'.



$7x^2 - 34x - 5 = 0$

Step 2 Write the factoring as two binomials, and read the numbers across.

$(x + 1)(7x - 5) = 0$

Step 3 State the solutions.

$x = 1$ and $x = \frac{5}{7}$

In step 1, the numbers above **a** and **c** are not in the correct order. The 1 and the 7 should be reversed.

In step 2, the factoring should read: (7x + 1) (x – 5)

In step 3, the correct solutions should be 5 and $\frac{-1}{7}$.