



Math Olympiad and Problem Solving Programs  
E120 - Honors Algebra Problem Solving  
Problem Set 16.1 - Factoring Quadratics

Name:

Date:

**Instruction:** Factor and solve the following equations. Show your work.

1.  $x = -3, 5$

2.  $x = -5, -4$

3.  $x = -4, 5$

4.  $x = -5$

5.  $x = -7, 3$

6.  $x = -12, -3$

7.

$$\begin{aligned}2x^2 + 19x - 10 &= 0 \\(2x - 1)(x + 10) &= 0 \\x &= \boxed{-10, \frac{1}{2}}\end{aligned}$$

8.

$$\begin{aligned}5x^2 + 52x + 63 &= 0 \\(5x + 7)(x + 9) &= 0 \\x &= \boxed{-9, -\frac{7}{5}}\end{aligned}$$

9.

$$\begin{aligned}x - 6 + \frac{5}{x} &= 0 \\x^2 - 6x + 5 &= 0 \\(x - 5)(x - 1) &= 0 \\x &= \boxed{1, 5}\end{aligned}$$



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10. We isolate the square root and square both sides to get rid of the square root and to form a quadratic equation that we're familiar with. However, when we square both sides we are adding an extra solution:

$$\begin{aligned}x + \sqrt{2x} - 4 &= 0 \\x - 4 &= -\sqrt{2x} \\x^2 - 8x + 16 &= 2x \\x^2 - 10x + 16 &= 0 \\(x - 2)(x - 8) &= 0 \\x &= 2, 8\end{aligned}$$

However, the squared equation is not exactly the same as our original equation so we plug both solutions into our original equation to see that the only valid solution is  $\boxed{x = 2}$ .