Solving Quadratics by Factoring

Name:_____

Solving Quadratics by Factoring

Steps to solve $ax^2 + bx + c = 0$.

1. Factor to $(\alpha_1 x + \beta_1)(\alpha_2 x + \beta_2) = 0$

2. Each factor gives a solution.

$$(\alpha_1 x + \beta_1)(\alpha_2 x + \beta_2) = 0$$

$$\alpha_1 x + \beta_1 = 0 \qquad \alpha_2 x + \beta_2 = 0$$

$$x = -\frac{\beta_1}{\alpha_1} \qquad x = -\frac{\beta_2}{\alpha_2}$$

1. **(Basic Problems)** Factor and solve.

(A) $x^2 + 5x + 6 = 0$ **(B)** $x^2 + 7x + 6 = 0$ **(C)** $x^2 - x - 6 = 0$

(D) $x^2 - 7x + 10 = 0$ **(E)** $x^2 + 3x - 10 = 0$ **(F)** $x^2 - 9x - 10 = 0$

(G) $x^2 + 9x + 20 = 0$ **(H)** $x^2 - x - 20 = 0$ **(I)** $x^2 - 8x - 20 = 0$

2. **(Basic Patterns)** Factor and solve.

(A) $x^2 - 9 = 0$ **(B)** $x^2 + 6x + 9 = 0$ **(C)** $x^2 - 6x + 9 = 0$

3. (**Medium**) Factor and solve.

   (**A**) $2x^2 + 18x + 16 = 0$

   (**B**) $3x^2 + 18x + 24 = 0$

   (**C**) $2x^2 - 14x - 16 = 0$

4. (**Messy**) Factor and solve.

   (**A**) $2x^2 + 7x + 6 = 0$

   (**B**) $2x^2 + 13x + 6 = 0$

   (**C**) $2x^2 - x - 6 = 0$

   (**D**) $3x^2 - x - 10 = 0$

   (**E**) $3x^2 - 11x + 10 = 0$

   (**F**) $3x^2 - 7x - 10 = 0$

5. (**Messy Patterns**) Factor and solve.

   (**A**) $16x^2 - 24x + 9 = 0$

   (**B**) $4x^2 - 9 = 0$

   (**C**) $16x^2 + 24x + 9 = 0$