

Name:

Date:

Goal: factoring when $a=1$

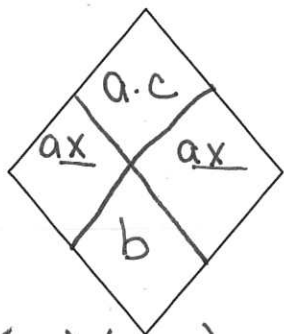
Class/Period:

using the Diamond Method

Questions/Main Ideas:

Notes:

$$ax^2 + bx + c$$



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Use the diamond method to factor: $x^2 + 3x + 2$
 $ax^2 + bx + c$

What multiplies together to give us 2, and adds together to give us 3.

$$\begin{array}{r} 2 \\ 1 \overline{) 2} = 3 \end{array}$$

$(x+1)(x+2)$

Examples!!!

factor: $a^2 + 7a + 10$

$$\begin{array}{r} 10 \\ 2 \overline{) 10} = 5 \end{array}$$

$(a+2)(a+5)$

factor: $x^2 + 11x + 18$

$$\begin{array}{r} 18 \\ 2 \overline{) 18} = 9 \end{array}$$

$(x+2)(x+9)$

factor: $x^2 + 9x + 14$

$$\begin{array}{r} 14 \\ 2 \overline{) 14} = 7 \end{array}$$

$(x+7)(x+2)$

Let's try some that are a little more "Different"

factor: $x^2 - 4x + 3$

$$\begin{array}{r} \cancel{x} \quad \cancel{3} \\ -1 \quad \quad \quad \cancel{x} \\ \quad \quad \quad \cancel{-4} \quad \quad \quad \cancel{-3} \end{array}$$

$$\begin{array}{r} 3 \\ 1 \mid 3 \\ \hline -1 \mid -3 = -4 \end{array}$$

$$(x-1)(x-3)$$

factor: $x^2 - 8x + 12$

$$\begin{array}{r} \cancel{x} \quad \cancel{12} \\ -2 \quad \quad \quad \cancel{x} \\ \quad \quad \quad \cancel{-8} \quad \quad \quad \cancel{-6} \end{array}$$

$$\begin{array}{r} 12 \\ -2 \mid -6 = -8 \end{array}$$

$$(x-2)(x-6)$$

factor: $x^2 + x - 20$

$$\begin{array}{r} \cancel{x} \quad \cancel{-20} \\ -4 \quad \quad \quad \cancel{x} \\ \quad \quad \quad \cancel{1} \quad \quad \quad \cancel{5} \end{array}$$

$$\begin{array}{r} -20 \\ 1 \mid -20 \\ -1 \mid 20 \\ 4 \mid -5 = -1 \\ -4 \mid 5 = 1 \end{array}$$

$$(x-4)(x+5)$$

factor: $y^2 - 7y - 18$

$$\begin{array}{r} \cancel{y} \quad \cancel{-18} \\ 2 \quad \quad \quad \cancel{y} \\ \quad \quad \quad \cancel{-7} \quad \quad \quad \cancel{-9} \end{array}$$

$$\begin{array}{r} -18 \\ 1 \mid -18 \\ -1 \mid 18 \\ 2 \mid -9 = -7 \\ -2 \mid 9 \end{array} \quad (y+2)(y-9)$$

Challenge:

$$x^2 + 9xy + 14y^2$$

$$ax^2 + bx + c$$

$$a = 1$$

$$b = 9y$$

$$c = 14y^2$$

$$\begin{array}{ccc} & 14y^2 & \\ \frac{x}{2y} & & \frac{x}{7y} \\ & 9y & \end{array}$$

$$\begin{array}{r|l} 14y^2 & \\ \hline 1y & 14y \\ 2y & 7y = 9y \star \end{array}$$

$$(x + 2y)(x + 7y)$$

Check:

$$x^2 + \underbrace{7xy + 2xy} + 14y^2$$

$$x^2 + 9xy + 14y^2$$