

Quick warm-up!

Factor:

$$\textcircled{1} \quad \frac{49n^4}{7n^2} - \frac{7n^3}{7n^2} + \frac{14n^2}{7n^2}$$

$$7n^2(7n^2 - n + 2)$$

$$\textcircled{2} \quad \frac{-16x^3y}{-16xy} + \frac{48xy^2}{-16xy}$$

$$-16xy(x^2 - 3y)$$

9.5 notes

• what does it mean to FACTOR? un distributing

Fill in the blanks:

$$1) (x + \underline{4})(x + \underline{3}) = x^2 + \underline{3x} + 4x + 12 \checkmark$$

check:

$$x^2 + 3x + 4x + 12$$

$$2) (x + 5)(x + \underline{4}) = x^2 + \underline{9x} + 20$$

check:

$$x^2 + \underline{4x} + 5x + 20$$

$$x^2 + \underbrace{7x + 5x + 24}_{9x}$$

$$3) (x+8)(x+3) = x^2 + 11x + 24$$

check:

$$x^2 + 3x + 8x + 24 \Rightarrow x^2 + 11x + 24$$

$$4) (x+2)(x-6) = x^2 - 4x - 12$$

check:

$$x^2 - 6x + 2x - 12 \rightarrow x^2 - 4x - 12$$

$$5) (x-11)(x-2) = x^2 - 13x + 22$$

check:

Factoring a trinomial into 2 binomials

$$ax^2 + bx + c$$

Find 2 #s whose sum is = b, & whose product is = c.

$$\text{Ex: } x^2 + 7x + 10 \quad \begin{matrix} b \\ 7 \\ c \\ 10 \end{matrix} \quad 5, 2$$

$$\boxed{5} + \boxed{2} = 7 \quad \boxed{5} \times \boxed{2} = 10$$

$$(x+5)(x+2)$$

Factor (UNFOIL) the trinomial:

$$1) x^2 + 11x + 18 \quad \begin{matrix} 9 \cdot 2 = 18 \\ 9 + 2 = 11 \end{matrix}$$

$$2) x^2 - 3x + 2 \quad \begin{matrix} -1 \cdot -2 = 2 \\ -1 + -2 = -3 \end{matrix}$$

$$1) x^2 + 11x + 18 \quad \begin{array}{l} 9 \cdot 2 = 18 \\ 9 + 2 = 11 \end{array}$$

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

$$2) x^2 - 3x + 2 \quad \begin{array}{l} -1 \cdot -2 = 2 \\ -1 + -2 = -3 \end{array}$$

$$(x - 1)(x - 2)$$

check:  $x^2 + 2x + 9x + 18 \Rightarrow x^2 + 11x + 18 \checkmark$

check:  $x^2 - 2x - x + 2 \Rightarrow x^2 - 3x + 2$

$$3) n^2 - 6n + 8 \quad \begin{array}{l} -2 + -4 = -6 \\ -2 \cdot -4 = 8 \end{array}$$

$$(n - 2)(n - 4)$$

$$4) a^2 - a - 56 \quad \begin{array}{l} -8 + 7 = -1 \\ -8 \cdot 7 = -56 \end{array}$$

$$(a - 8)(a + 7)$$

$$5) a^2 - 16a + 63 \quad \begin{array}{l} -9 + -7 = -16 \\ -9 \cdot -7 = 63 \end{array}$$

$$(a - 9)(a - 7)$$

$$6) x^2 - 6x - 27 \quad \begin{array}{l} 3 + -9 = -6 \\ 3 \cdot -9 = -27 \end{array}$$

$$(x + 3)(x - 9)$$

$$7) \frac{3t^2}{3} + \frac{27t}{3} + \frac{60}{3} \quad \begin{array}{l} 4 + 5 = 9 \\ 4 \cdot 5 = 20 \end{array}$$

$$3(t^2 + 9t + 20)$$

$$3(t + 4)(t + 5)$$

$$8) \frac{-x^3}{-x} + \frac{x^2}{-x} + \frac{20x}{-x}$$

$$-x(x^2 - x - 20)$$

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

check:  $3(t^2 + 5t + 4t + 20)$   
 $3(t^2 + 9t + 20)$

$$\boxed{-5} + \boxed{4} = -1$$

$$\boxed{-5} \cdot \boxed{4} = -20$$

$$3(t^2 + 9t + 20)$$

$$3t^2 + 27t + 60$$

$$\boxed{-5} \cdot \boxed{4} = -20$$

Challenge! solve for x or w

$$1) W^2 + 6W - 16 = 0$$

$$(W + 8)(W - 2) = 0$$

$$\begin{array}{r} / \quad \backslash \\ W + 8 = 0 \quad W - 2 = 0 \\ \underline{-8 \quad -8} \quad \underline{+2 \quad +2} \end{array}$$

$$\boxed{W = -8} \quad \boxed{W = 2}$$

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$$2) X^2 - 4X = -3$$

$$\begin{array}{r} +3 \quad +3 \\ \hline X^2 - 4X + 3 = 0 \end{array}$$

$$(X - 3)(X - 1) = 0$$

$$\begin{array}{r} / \quad \backslash \\ X - 3 = 0 \quad X - 1 = 0 \\ \underline{+3 \quad +3} \quad \underline{+1 \quad +1} \end{array}$$

$$\boxed{X = 3} \quad \boxed{X = 1}$$