

Algebra 1

Chapter 8

Section 8-7

Review: Factoring a Polynomial

$$\begin{array}{l} x^2 - 6x - 27 \\ \text{sum} \quad \text{prod.} \\ (x-9)(x+3) \end{array}$$

$$\begin{array}{l} 10y^2 - 16y \\ 2y(5y-8) \end{array}$$

$$\begin{array}{l} \begin{array}{cc} -40 & 20, 2 \\ \swarrow \text{mult} & \searrow \end{array} \\ 5k^2 + 18k - 8 \\ \begin{array}{l} 5k^2 + 20k - 2k - 8 \\ \underline{5k(k+4) - 2(k+4)} \\ (k+4)(5k-2) \end{array} \end{array}$$

Review: Multiplying special cases

$$\begin{aligned}(x - 5)^2 \\ (x - 5)(x - 5) \\ x^2 + 2(x)(-5) + 25 \\ x^2 - 10x + 25\end{aligned}$$

$$\begin{aligned}(s - 8)(s + 8) \\ s^2 - 64\end{aligned}$$

Review: Special case formulas

$$(a + b)^2 = \underline{a^2} + 2ab + \underline{b^2}$$

$$(a + b)(a - b) = \underline{a^2} - \underline{b^2}$$

Factoring Special Cases

$$\sqrt{x^2} = x$$

$$x^2 + 6x + \underline{9}$$

$$(x+3)^2$$

$$(x+3)(x+3)$$

$$\sqrt{9} = 3$$

$$5x \quad \sqrt{\quad} \quad 2$$

$$\underline{25x^2} + 20x + \underline{4}$$

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

Factoring Special Cases

Difference of squares

$$\sqrt{1} = 1 \quad \leftarrow \quad 1 - y^2 \quad \rightarrow \quad \sqrt{y^2} = y$$

$$(1+y)(1-y)$$

$$49y^4 - 4$$

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

Factoring Special Cases

$$x^2 - 49$$
$$(x-7)(x+7)$$

$$100y^2 - 1$$
$$(10y-1)(10y+1)$$

Combining Factoring Types

$$9x^3 - 27x^2 - 90x$$

GCF $\underline{9x}(x^2 - 3x - 10)$ 2, -5

$\underline{9x}(x+2)(x-5)$

Combining Factoring Types

$$44x^4 - 99x^2$$

$$11x^2(4x^2 - 9)$$

$$11x^2(2x-3)(2x+3)$$

Combining Factoring Types

$$30x^2 - 25x - 30$$

$5(6x^2 - 5x - 6)$ prod. $\frac{-36}{-9, 4}$ sum: -5

$6x^2 - 9x + 4x - 6$

$3x(2x-3) + 2(2x-3)$

$5(2x-3)(3x+2)$

Combining Factoring Types

$$x^6 + 14x^5 + 49x^4$$
$$x^4(x^2 + 14x + 49)$$
$$x^4(x+7)^2$$