

Do Now

Factor each expression

$$1) \frac{x^3}{x^2} - \frac{3x^2}{x^2} \quad \text{GCF} = x^2 \quad 2) \frac{-2x^3}{2x} - \frac{8x^2}{2x} + \frac{2x}{2x} \quad \text{GCF} = 2x$$

$$x^2(x-3) \quad 2x(-x^2 - 4x + 1)$$

$$3) 7x^3(x-5) - 7x(x-5)$$

$$(7x^3 - 7x)(x-5)$$

$$\text{GCF} = 7x$$

$$7x(x^2 - 1)(x-5)$$

$$\text{OR}$$

$$-2x(x^2 + 4x - 1)$$

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HW Answers

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1) $c(8c + 7)$

5) $6n(n^5 + 3n^3 - 4)$

2) $3n^2(n + 4)$

6) $5m^2(-m^2 - m + 1)$ OR

3) $3x(5x^4 - 6)$

$-5m^2(m^2 + m - 1)$

4) $4(-2s^4 + 5t^3 - 7)$ OR

9) $(m + 5)(3m + 4)$

$-4(2s^4 - 5t^3 + 7)$

10) $(b - 3)(16b + 1)$

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Factor by Grouping

Use when a polynomial has **FOUR** terms and **NO COMMON GCF**

-Group into two pairs of two terms \rightarrow 2 binomials

Factor out the GCF of each Group

- If terms have no GCF use 1 or -1 (if the lead coefficient is a negative number)

Factor out the common binomial factor

Rewrite your final answer as two binomials

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Factor by Grouping

$$GCF = a^2 \quad \frac{a^3 + 3a^2}{a^2} + \frac{2a + 6}{2} \quad a^2 = 2$$

$$a^2(a+3) + 2(a+3)$$

$$(a+3)(a^2+2)$$

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Factor by Grouping

$$\left(\begin{array}{c} 5x^3 - 5x^2 \\ \hline 5x^2 \end{array} \right) \left(\begin{array}{c} -2x + 2 \\ \hline -2 \end{array} \right) \text{ GCF} = -2$$

$$\left(5x^2 \right) (x-1) \left(-2 \right) (x-1)$$

$$(x-1)(5x^2 - 2)$$

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3) $x^3 + 4x^2 + 8 + 2x$

$$(x^3 + 4x^2) + (2x + 8)$$

$$x^2(x+4) + 2(x+4)$$

$$(x^2 + 2)(x + 4)$$

4) $(w^3 - 2w^2) - 5w + 10$

$$w^2(w-2) - 5(w-2)$$

$$(w^2 - 5)(w-2)$$

OR

$$(w-2)(w^2 - 5)$$

5) $3b^3 + 2b^2 + 3b + 2$

$$(3b^3 + 3b) + (2b^2 + 2)$$

$$3b(b^2 + 1) + 2(b^2 + 1)$$

$$(3b + 2)(b^2 + 1)$$

6) $15b^3 + 10b^2 - 3b - 2$

$$5b^2(3b+2) - 1(3b+2)$$

$$(5b^2 - 1)(3b + 2)$$

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