Do Now

Factor each expression

1) $x^3 - 3x^2$ GCF = x^2

$x^2(x - 3)$

2) $-2x^3 - 8x^2 + 2x$ GCF = $2x$

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

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

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

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Homework Answers

1. $c(8c - 7)$
2. $3n^2 (n + 4)$
3. $3x (5x^4 - 6)$
4. $4(2s^4 + 5t^3 - 7)$
5. $6n(n^5 + 3n^3 - 4)$
6. $5m^2(m^2 - m + 1)$
7. $(m + 5)(3m + 4)$
8. $(b - 3)(16b + 1)$

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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

Factor out the GCF of each group

-If terms has no GCF, use 1 or -1

2nd grouping if the 1st coefficient is negative Make the GCF negative

Factor out the common binomial factor

Rewrite your final answer as two binomials

(Common Binomial)(Circled Monomials)

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Factor by Grouping

$$(a^3 + 3a^2)(+ 2a + 6)$$

$a^2 \quad a^2 \quad 2 \quad 2$

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

$$\boxed{(a^2+2)(a+3)}$$

a^3	$a \cdot a \cdot a$
$3a^2$	$3 \cdot a \cdot a$

GCF $= a^2$

$2a$	$2 \cdot a$
6	$2 \cdot 3$

GCF $= 2$

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Factor by Grouping

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

$$\frac{5x^3}{5x^2} \quad \frac{5x^2}{5x^2} \quad \frac{-2x}{-2} \quad \frac{2}{-2}$$

$$\begin{array}{c|ccc} 5x^3 & 5 & x & x \cdot x \\ \hline 5x^2 & 5 & x & x \end{array} \quad 5x^2$$

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

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

OR

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

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Factor by Grouping

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

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

$$\frac{x^3}{x^2} \quad \frac{4x^2}{x^2} \quad \frac{2x}{2} \quad \frac{8}{2}$$

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

$$\boxed{(x^2+2)(x+4)}$$

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Factor by Grouping

$4b^3 - 2x^2 - 2x + 1$

$2x^2 \quad 2x^2 \quad -1 \quad -1$

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

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

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Factor by Grouping

$w^3 - 2w^2 - 5w + 10$

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

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

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Factor by Grouping

1) $\frac{3b^3}{b^2} + \frac{2b^2}{b^2} + \frac{3b}{1} + \frac{2}{1}$

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

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

2) $\frac{4x^3}{2x^2} - \frac{2x^2}{2x^2}\left(-\frac{2x}{-1} + \frac{1}{-1}\right)$

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

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

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