

Objectives:

- Students will be able to factor out a common factor and to factor polynomials by grouping.

Vocabulary:

- Factoring means to write something as a product
 - i.e. $6 = 3 \cdot 2$

Distribution:

$$1. \quad 3(x+4)$$

$$= 3(x) + 3(4)$$

$$= \boxed{3x + 12}$$

$$2. \quad (m+3)(2m^2+6)$$

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

$$\boxed{2m^3 + 6m^2 + 6m + 18}$$

Example Set 1: Factor out the common factor and write your answer in factored form.

$$1. \quad 3x + 12$$

$$3(x) + 3(4)$$

$$\boxed{3(x+4)}$$

$$2. \quad 2x + 4$$

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

CHECK:
DISTRIBUTE
 $2x + 4 \checkmark$

$$3. \quad 8x^2 + 4x$$

$$\boxed{4x(2x+1)}$$

$$4. \quad 12xy^2 + 18x^3y^4$$

$$\boxed{6xy^2(2+3x^2y^2)}$$

CHECK:
DISTRIBUTE
 $8x^2 + 4x \checkmark$

Example Set 2: Factor each polynomial by grouping

HAVE TO HAVE 4 TERMS!

$$1. \quad \underline{2m^3 + 6m^2} + \underline{6m + 18}$$

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

$$= (m+3)(2m^2+6)$$

$$= \boxed{2(m+3)(m^2+3)}$$

$$2. \quad \underline{32xy + 40x} - \underline{4y - 5}$$

$$8x(4y+5) - 1(4y+5)$$

$$\boxed{(4y+5)(8x-1)}$$

6.2 - In Class Practice

Date _____ Period _____

Factor the common factor out of each expression.

1) $10x^4 + 30x^3$

$$10x^3(x+3)$$

2) $20a^4 + 36a$

$$4a(5a^3+9)$$

3) $-48p^5 - 24p^2 - 42p$

$$-6p(8p^4+4p+7)$$

4) $3x^2 + 7x^2y + 9x^3$

$$x^2(3+7y+9x)$$

5) $28u^3v^3 + 8u^3v + 32u^2v$

$$4u^2v(7uv^2+2u+8)$$

6) $40x^5y^2 - 32x^2y^4$

$$8x^2y^2(5x^3-4y^2)$$

Factor each completely.

7) $5b^3 + 3b^2 - 35b - 21$

$$= b^2(5b+3) - 7(5b+3)$$

$$= (5b+3)(b^2-7)$$

9) $32ab + 40a - 4b - 5$

$$8a(4b+5) - 1(4b+5)$$

$$(4b+5)(8a-1)$$

11) $8mc + 15nd - 10md - 12nc$

$$+(8mc+15nd) - 2(5md+6nc)$$

$$8mc - 10md + 15nd - 12nc$$

$$2m(4c-5d) - 3n(5d+4c)$$

13) $42xy + 36 + 12x + 126y$

$$42xy+12x+36+126y$$

$$6x(7y+2) + 18(2+7y)$$

$$= (7y+2)(6x+18)$$

$$= (6(7y+2)(x+3))$$

8) $12xy + 21x + 20y + 35$

$$3x(4y+7) + 5(4y+7)$$

$$(4y+7)(3x+5)$$

10) $18ac - 3ad + 12bc - 2bd$

$$3a(bc-d) + 2b(bc-d)$$

$$(bc-d)(3a+2b)$$

12) $2xy + 8vx + x^2 + 16vy$

$$2xy+x^2+8vx+16vy$$

$$x(2y+x) + 8v(x+2y)$$

$$(x+2y)(x+8v)$$

14) $90xy + 120 - 72x - 150y$

$$90xy - 72x + 120 - 150y$$