Warm-Up:
1) Find the GCF for the following terms.
$28r^3t^2$, $35r^2t^4$, $70r^2t^2$

$\boxed{7r^2t^2}$

:)

Section 8-2: Factoring Using the Distributive Property

The first step in factoring any polynomial is using the Distributive Property and take out the GCF of all the terms.

Examples:
Use the Distributive Property to factor each polynomial.
1) $15x + 25x^2$

$$5x(3+5x)$$

2) $12xy + 24xy^2 - 30x^2y^4$

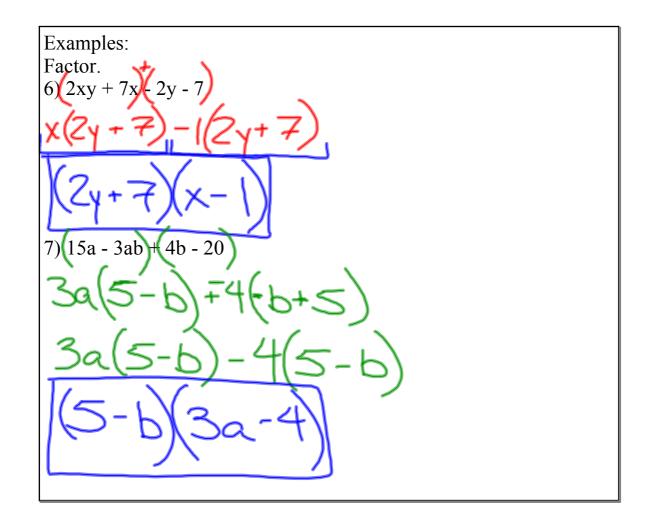$$6xy(2+4y-5xy^3)$$

Factor.
3) $q^4 - 18q^3 + 22q$

$$q(q^3 - 18q^2 + 22)$$

4) $6y - 12x + 8z$

$$2(3y - 6x + 4z)$$

5) $4a^2b + 28ab^2 + 7ab$

$$ab(4a + 28b + 7)$$

A polynomial with four terms can sometimes be factored using the Distributive Property three times. This is called factoring by grouping.

To factor by grouping:
1) Factor out the GCF of the first two terms.
2) Factor out the GCF of the second two terms.
3) Factor out the common binomial in the parenthesis.

Examples:
Factor.
6) $2xy + 7x - 2y - 7$

$x(2y + 7) - 1(2y + 7)$

$(2y + 7)(x - 1)$

7) $15a - 3ab + 4b - 20$

$3a(5 - b) + 4(-b + 5)$

$3a(5 - b) - 4(5 - b)$

$(5 - b)(3a - 4)$

Examples:
Factor.
8) $6y^2 - 4y + 3y - 2$

$$2y(3y-2) + 1(3y-2)$$

$$(3y-2)(2y+1)$$

$(a)(b) = 0$

What must *a* or *b* equal?

$$a = 0 \text{ or } b = 0$$

Zero Product Property:
If the product of two numbers is zero, then one of the numbers must also be zero.

Examples:
Solve for the variable.
9) $(x + 2)(x - 3) = 0$

$$x + 2 = 0 \quad \text{or} \quad x - 3 = 0$$
$$\underline{-2 \quad -2} \qquad \underline{+3 \quad +3}$$
$$\boxed{x = -2 \quad \text{or} \quad x = 3}$$

10) $2x(x + 4) = 0$

$$\frac{2x}{2} = \frac{0}{2} \quad \text{or} \quad x + 4 = 0$$
$$\qquad\qquad\qquad \underline{-4 \quad -4}$$
$$\boxed{x = 0 \quad \text{or} \quad x = -4}$$

11) $(2x - 1)(3x + 2) = 0$

$$2x - 1 = 0 \quad \text{or} \quad 3x + 2 = 0$$
$$\underline{+1 \quad +1} \qquad\qquad \underline{-2 \quad -2}$$
$$\frac{2x}{2} = \frac{1}{2} \qquad\qquad \frac{3x}{3} = \frac{-2}{3}$$
$$\boxed{x = \tfrac{1}{2} \quad \text{or} \quad x = \tfrac{-2}{3}}$$

Homework: pg. 429-431 #10-36 even, 37, 42, 45, 46

Section 8-2 Vocab