**8-2 notes part 1**

Factoring using the distributive property

Distributive property:

$$2a\left(6a+8\right)=\left(2a\right)\left(6a\right)+\left(2a\right)\left(8\right)=12a^{2}+16a$$

Reverse the process:

$$12a^{2}+16a=2a\left(6a+8\right)$$

Example 1:

$$16a+4b$$

Example 2:

$$3p^{2}q-9pq^{2}+36pq$$

Factor by grouping

Polynomials having 4 or more terms may be grouped to factor.

Example 3:

$$4ab+8b+3a+6=\left(4ab+8b\right)+\left(3a+6\right) $$

$$ =4b\left(a+2\right)+3\left(a+2\right)$$

$$=(4b+30(a+2)$$

Example 4:

$$6x^{2}-15x-8x+20=\left(6x^{2}-15x\right)-\left(8x+20\right)$$

$$=3x\left(2x-5\right)-4\left(2x-5\right)$$

$$=\left(3x-4\right)\left(2x-5\right)$$

Example 5:

$$rs+5s-r-5$$

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**8-2 notes part 2**

**Zero product property**

Factor, set all the parts equal to zero and solve. The solutions of the equation are called the roots.

Example 1:

$$\left(d-5\right)\left(3d+4\right)=0$$

$$d-5=0 3d+4=0 solve$$

$$d=5, d=-\frac{4}{3}$$

Example 2:

$$x^{2}=7x$$

$$x^{2}-7x=0$$

$$x\left(x-7\right)=0$$

$$x=0 x-7=0 solve$$

$$x=0, 7$$