

## There are four different ways to factor:

** Factoring: rewriting a sum as a product **

## 1. Greatest Common Factor

2. Difference of Squares
3. Leading Coefficient of One (Diamonds)
4. Leading Coefficient is Not One (Box \& Diamond)


Factoring Flow Chart

Use the factoring flow chart and FACTOR the following expressions COMPLETELY:

EX \#1: $\quad 2 x^{4}-14 x^{3}-60 x^{2}$
$<_{-7}^{-30} 2 x^{2}\left(x^{2}-7 x-30\right)$

EX \#2:

$$
\begin{gathered}
\frac{27 x^{3} y}{3 x y}-\frac{12 x y^{3}}{3 x y} \\
3 x y\left(\sqrt{9 x^{2}}-\sqrt{4 y^{2}}\right) \\
3 x y(3 x+2 y)(3 x-2 y)
\end{gathered}
$$

EX \#3:



Factor Completely

Zero Product Property
if $a \cdot b=0$, then either $a=0$ or $b=0$
Ex) $\begin{gathered}(x+3)(x-8)=0 \\ \downarrow \quad \downarrow\end{gathered}$

$$
\begin{array}{ll}
x+3=0 & x-8=0 \\
x=-3 & x=8
\end{array}
$$

SOLVE the following by factoring then using the ZPP:
EX \#6:

$$
18 x^{3}=12 x^{2}
$$

$$
\text { Coset }=0
$$

$$
\begin{aligned}
& 18 x^{3}-12 x^{2}=0 \\
& \left(6 x^{2}\right)(3 x-2)=0
\end{aligned}
$$

$\frac{6 x^{2}}{6}=\frac{0}{6}$
$3 x-2=0$

$3 x=2$
$x=\frac{2}{3}$
EX \#7:

$$
4 x^{3}+12 x^{2}=16 x
$$

$$
4 x^{3}+12 x^{2}-16 x=0
$$

-4

$$
4 x\left(x^{2}+3 x-4\right)=0
$$

$$
(4 x)(x+4)(x-1)=0
$$

$$
4 x=0
$$

$$
\begin{array}{r}
x+4=0 \\
x=-4
\end{array}
$$

$$
x-1=0
$$

$$
x=0 \quad x=-4
$$

Zero Product Property



Homework:
Unit \#1 Day \#4 worksheets

HZ
(1) $\left(4 x^{2} y^{-3}\right)^{-2}\left(2 x^{-1} y^{-4}\right)^{3}$
(2) $\frac{\left(8 x^{-1} y^{-4}\right)^{-2}}{\left(2 x^{-3} y^{2}\right)^{-3}}$
(3) $\sqrt{108}$
(4) $(27)^{\frac{2}{3}}$
(5) $\left(\frac{609}{81}\right)^{-\frac{3}{4}}$

