

9.4: Solve Polynomials
in factored form

Zero Product Property: Let a & b
be real #s. If $ab = 0$, then $a = 0$
or $b = 0$.

example 1: Solve $(x-4)(x+2)=0$

$$(4-4)(4+2) = 0 \cdot 6 = 0 \quad \checkmark$$

Set each polynomial equal to zero; b/c \dagger zero product prop.

$$x-4=0$$

$$+4 \quad +4$$

$$x=4$$

$$x+2=0$$

$$-2 \quad -2$$

$$x=-2$$

$$x=4, -2$$

$$(-2-4)(-2+2)$$

$$(-6)(0)=0$$

example 2: Solve $(x-5)(x-1)=0$

$$\begin{array}{r} x-5=0 \\ +5 \quad +5 \end{array}$$

$$x=5$$

$$\begin{array}{r} x-1=0 \\ +1 \quad +1 \end{array}$$

$$x=1$$

$$x=5, 1$$

ex. 3 : Solve: $(x+3)(2x-5)=0$

$$\begin{array}{r} x+3=0 \\ -3 \quad -3 \end{array} \quad x = -3, \frac{5}{2}$$

$$\begin{array}{r} 2x-5=0 \\ +5 \quad +5 \end{array} \quad \frac{2x}{2} = \frac{5}{2} \quad x = \frac{5}{2}$$

Factoring : Look for the greatest common factor between all of the terms.

GCF : The greatest # that goes in to all the #s.

ex. 4 Factor out the gcf of

$$1, 2, 3, 4, 6 \mid 12x + 42y \quad 2, 3, 4, 7$$
$$6(2x + 7y)$$

ex. 5

$$4x^4 + 24x^3$$

1,2,4

$$4x^3(x + 6)$$

1,2,3,4

ex. 6

$$8x + 12y$$

$$4(2x + 3y)$$

ex. 7

$$14y^2 + 21y$$

$$7y(2y + 3)$$

Solve equations by factoring out the GCF.

ex. 8: $2x^2 + 8x = 0$

Factor out the gcf: $2x(x+4) = 0$

Set each polynomial equal to zero.

$$\frac{2x}{a} = \frac{0}{a}$$

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

$$x=0$$

$$x=-4$$


$$x=0, -4$$

ex. 9 § Solve $6n^2 = 15n$

Set equation = 0.

$$\begin{array}{r} 6n^2 = 15n \\ -15n \quad -15n \end{array}$$

$$n = 0, \frac{5}{2}$$

$$6n^2 - 15n = 0$$

Factor out GCF:

$$3n(2n - 5) = 0$$

$$\begin{array}{l} \frac{2n}{2} = \frac{5}{2} \\ n = \frac{5}{2} \end{array}$$

We set both equal to zero:

$$\frac{3n}{3} = \frac{0}{3} \quad n = 0$$

$$\begin{array}{r} 2n - 5 = 0 \\ +5 \quad +5 \\ 2n = 5 \end{array}$$

On your own.

① Solve $(x+5)(x-3)=0$ $x=-5, 3$

② Solve $(2x-1)(x+4)=0$ $x=\frac{1}{2}, -4$

③ Solve $x(3x-5)=0$ $x=0, \frac{5}{3}$

④ Solve $4x^2 - 16x = 0$ $4x(x-4)$
 $x=0, 4$

⑤ Solve $3x^3 + 9x^2 = 0$ $3x^2(x+3)$
 $x=0, -3$

⑥ Solve $12x^2 = 16x$
 $12x^2 - 16x = 0$
 $4x(3x-4) = 0$ $x=0, \frac{4}{3}$

