

# Algebra I

## 5-12

### Solving Equations by Factoring

$$\overset{\text{factors}}{a} \cdot \overset{\text{product}}{b} = 0$$

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

Solve. (pg 232)

1)  $(y+5)(y-7)=0$

is it factored? Yes  
is it = 0? Yes

$$y+5=0 \text{ or } y-7=0$$

$$y=-5 \quad y=7$$

$$\{-5, 7\}$$

3)  $15n(n+15)=0$

Factored? Yes  
= 0? Yes

$$\frac{15n}{15} = \frac{0}{15} \quad n+15=0$$

$$n=0 \quad n=-15$$

$$\{0, -15\}$$

7)  $3x(2x+1)(2x+5)=0$

factored? Yes  
= 0? Yes

$$\frac{3x}{3} = 0 \text{ or } \frac{2x+1}{2} = \frac{0}{2} \text{ or } \frac{2x+5}{2} = \frac{0}{2}$$

$$x=0 \quad \frac{2x}{2} = \frac{-1}{2} \quad \frac{2x}{2} = \frac{-5}{2}$$

$$x = -\frac{1}{2} \quad x = -\frac{5}{2}$$

$$\left\{0, -\frac{1}{2}, -\frac{5}{2}\right\}$$

9)  $y^2 - 3y + 2 = 0$

factored? NO!

$$(y-1)(y-2)=0$$

Factored? Yes  
= 0? Yes

$$y-1=0 \text{ or } y-2=0$$

$$\{1, 2\}$$

13)  $m^2 - 36 = 16m$

$$m^2 - 16m - 36 = 0$$

$$(m-18)(m+2)=0$$

$$m-18=0 \text{ or } m+2=0$$

$$\{18, -2\}$$

$$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-16) \pm \sqrt{(-16)^2 - 4(1)(-36)}}{2(1)}$$

17)  $y^2 = 16y$

$$y^2 - 16y = 0$$

$$y(y-16)=0$$

$$y=0 \text{ or } y-16=0$$

$$\{0, 16\}$$

19)  $4x^2 - 9 = 0$

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

$$2x+3=0 \text{ or } 2x-3=0$$

$$\frac{2x}{2} = \frac{-3}{2} \quad \frac{2x}{2} = \frac{3}{2}$$

$$\left\{-\frac{3}{2}, \frac{3}{2}\right\}$$

$$\text{or}$$

$$\left\{\pm \frac{3}{2}\right\}$$

43)  $(z+1)(z-5) = 16$

factored? Yes!  
= 0? No!

$$(z+1)(z-5) - 16 = 0$$

Factored? No!

$$z^2 - 5z + 1z - 5 - 16 = 0$$

$$z^2 - 4z - 21 = 0$$

$$(z-7)(z+3)=0$$

$$\{7, -3\}$$

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