## Algebra 2-7: Special Numbers in Equations

0, 1, -1

**Warm-Up**

**Solve. Show your work. Check.**

1. $3x = 21$

$\frac{3}{3} \quad \frac{3}{3}$

$x = 7$

$3 \cdot 7 = 21$

$21 = 21$ ✓

2. $8y = 10$

$\frac{8}{8} \quad \frac{8}{8}$

$y = 1.25$

$8(1.25) \stackrel{?}{=} 10$

$10 = 10$ yes!

3. $5z < 20$

$\frac{5}{5} \quad \frac{5}{5}$

$z < 4$

$5 \cdot 2 < 20$

$10 < 20$ ✓

4. $-\frac{1}{3}m \leq 2$

$\frac{-3}{1} \quad \frac{-3}{1}$

$m \geq -6$

- 0, 1, and -1 are SPECIAL #'s in math.
- 0 cannot be in the bottom of a fraction. → $\frac{5}{0}$ = error undefined
- 0 multiplied by any number = zero.
- -x is the same thing as -1x.

$0 \cdot 9 = 0$

$0 \cdot 5 = 0$

**Example Problems**

**Solve**. Show work. Check.

1. $0a = 10$ $\frac{0}{0}$ $\frac{10}{0}$ ← error

No Solution! ∅

2. $0x = 0$

$0 \cdot 5 = 0$

$0 \cdot 6 = 0$

$0 \cdot 100 = 0$

X = all real numbers

3. $8b = 0$ $\frac{8b}{8} = \frac{0}{8}$

$b = 0$

4. $-r = 4.35$ $\frac{-1r}{-1} = \frac{4.35}{-1}$

$r = -4.35$

5. Create an equation that has no solution. $0b = 9$ or $12 = 0b$

6. Create an equation that has -7 as the solution. $-x = 7$ / $-a = 7$

$\frac{-1x}{-1} = \frac{7}{-1}$

$x = -7$

$-6 - 1 = -7$

2-7 1-24, 10-12 solve

1. $\frac{13}{0} = \frac{0}{7} \times \frac{1}{0}$

↑ can't have zero in the bottom

2. $\frac{7}{7}y = \frac{0}{7}$ $1y = 0$. The solution is 0.

b) $\{0\}$

3. $\frac{0}{0} \cdot w = \frac{14}{0}$ a) There is no solution.

b) $\{\ \}$ $\emptyset$

4. $0 = a \cdot 0$ a) Any real number is a solution.

b) {real numbers}

$a = 1$

$a = -1$

$a = 0$

$a = 5$

$a = 6$

(5) $\emptyset$ d) $\{\ \}$

(6) $\frac{-1}{1} = \frac{1}{-1}$ or (-1)

(7) $\frac{-1}{-1} \cdot x = \frac{40}{-1}$

$x = -40$

(8) $\frac{-1y}{-1} = \frac{-3}{-1}$

$y = 3$

(9) $\frac{-1z}{-1} = \frac{0}{-1}$

$z = 0$

(10) $\frac{0x}{0} = \frac{-1.8}{0}$

$x = \emptyset$

(11) $\frac{24}{-1} = \frac{-1x}{-1}$

$-24 = x$

(12) $0x = 0$

$x =$ real #s

(13) $N = T \cdot P \cdot E \cdot O \cdot I \cdot C \cdot A$

$N = 0$

(14) $d = rt$

a) $70 = 0 \cdot t$

b) can't divide by 0