

BE-Algebra I TUESDAY 9-22-09

① Name each set of numbers:

Ⓐ $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

Ⓑ $\left\{\frac{a}{b}\right\}$ where a, b ARE ANY number in set Ⓐ
and $b \neq 0$

Ⓒ $\{\text{NON-terminating AND NON-repeating decimals}\}$

Ⓓ $\{\text{set Ⓑ, set Ⓒ}\}$

② Why is the expression $b \neq 0$ part of Ⓐ? ^{#1}

③ Name the sets of numbers to which
Each number belongs:

Ⓐ 5 Ⓑ $\frac{1}{5}$ Ⓒ $\sqrt{5}$ Ⓓ 5^2

④ Convert to a fraction: $0.\overline{4}$

• Homework review (see next page for answers)

• Quiz 4 questions?

• Summary:

Sign Rules

$+, -$ SSA, KSS/DSS, BOW/(-)(-)

$\cdot, \div$ SPDN

Fraction Rules

$+, -$ Common Denominator

$\cdot$ $\frac{\text{tops} \cdot \text{tops}}{\text{bottoms} \cdot \text{bottoms}}$

$\div$ flip and multiply

1.
Homework review: Convert to fractions: $.\overline{8}$, $0.\overline{24}$, $0.\overline{001}$.

① $.\overline{8}$ Let $N = 0.\overline{8}$

$$10N = 8.\overline{8}$$

$$-N \quad -.\overline{8}$$

$$9N = 8 \quad \therefore \boxed{N = \frac{8}{9}}$$

② $0.\overline{24}$ Let $N = 0.\overline{24}$

$$100N = 24.\overline{24}$$

$$-N \quad -.\overline{24}$$

$$99N = 24$$

$$\therefore \boxed{N = \frac{24}{99} = \frac{8}{33}}$$

③ $0.\overline{001}$ Let $N = 0.\overline{001} = 0.001111111\dots$

$$1000N = 1.1111111\dots$$

$$-N \quad -.\overline{001}$$

$$999N = 1.11$$

$$N = \frac{1.11}{999} = \frac{111}{99900} = \boxed{\frac{1}{900}}$$

TIP: THE "HEART" DIVISION

Simplify $\frac{12x+6}{3}$

$$\frac{12x+6}{3} = \frac{12x}{3} + \frac{6}{3} = \boxed{4x+2}$$

OR

$$\frac{1(12x+6)}{3} = \frac{1}{3}(12x+6) = \frac{12x}{3} + \frac{6}{3} = \boxed{4x+2} \checkmark$$

When solving equations, there are 2 special cases. In each, you do all of your "undos" correctly BUT...
 YOUR VARIABLE "GOES AWAY" !! You then look at the equation that is left.

- If the equation is TRUE $\Rightarrow$ ALL REAL NUMBERS
- If the equation is FALSE $\Rightarrow$ NO SOLUTION

* (EX) $3(d-8) = 3d$

$$\begin{array}{rcl} 3d - 24 & - & 3d \\ -3d & & -3d \end{array}$$

$\swarrow$ VARIABLE "GOES AWAY" !!

$-24 = 0$ FALSE $\therefore$ NO SOLUTION

* (EX) $3(a+1) - 5 = 3a - 2$

$$3a + 3 - 5 = 3a - 2$$

$$\begin{array}{rcl} 3a - 2 & = & 3a - 2 \\ -3a & & -3a \end{array}$$

$-2 = -2$ TRUE $\therefore$ ALL REAL NUMBERS

Your turn: Solve:

$$4(4-4K) = -10 - 16K$$

$$\overbrace{4(4-4K)} = -10 - 16K$$

$$\begin{array}{rcl} 16 - 16K & = & -10 - 16K \\ +16K & & +16K \end{array}$$

$$16 = -10 \quad \text{FALSE} \therefore \boxed{\text{No Solution}}$$

No value of K can ever make $16 = -10$ so there is no real number you can substitute for K to make a true expression. That is, no check can ever work $\therefore$ NO SOLUTION.



FORMULA

AN equation that expresses
A relationship between
physical things.

UNITS ARE VERY, VERY, IMPORTANT.

(EX)

$$F = ma$$

$$E = mc^2$$

$$A = bh$$

Here is a common formula you have probably already seen and used:

$$d = r t$$

distance = rate • time

ⓔx 600 miles = $60 \frac{\text{miles}}{\text{hour}} \cdot 10 \text{ hours}$

Notice how the units must work out exactly so they are the same on both sides of the equation:

$$\text{miles} = \frac{\text{miles}}{\cancel{\text{hour}}} \cdot \frac{\cancel{\text{hours}}}{1}$$

$$\text{miles} = \text{miles} \checkmark$$

$d = r t$ is the most common way to express the distance formula. But using "undos" you could "solve for r " $\Rightarrow$ get r by itself or "solve for t " $\Rightarrow$ get t by itself.

↑
(dis by itself)

ⓔ Given: $d = rt$, solve for t

$$\frac{d}{r} = \frac{rt}{r}$$

$$\frac{d}{r} = t \quad \text{or} \quad \boxed{t = \frac{d}{r}}$$

ⓔ Given $d = rt$, solve for r

$$\frac{d}{t} = \frac{rt}{t}$$

$$\frac{d}{t} = r \quad \text{or} \quad \boxed{r = \frac{d}{t}}$$

Summary of: $\boxed{d = rt}$

or $\boxed{t = \frac{d}{r}}$

or $\boxed{r = \frac{d}{t}}$

ⓔ $600 \text{ mi} = 60 \frac{\text{mi}}{\text{hr}} \cdot 10 \text{ hr}$

ⓔ $10 \text{ hr} = \frac{600 \text{ mi}}{60 \frac{\text{mi}}{\text{hr}}}$

ⓔ $60 \frac{\text{mi}}{\text{hr}} = \frac{600 \text{ mi}}{10 \text{ hr}}$

Homework:

① Page 152 # 27, 28

② Page 168 # 13 to 16.