BE-Algebra II Tuesday 9-27-11

1. Name each set of numbers:
   - (A) $\{\ldots -3, -2, -1, 0, 1, 2, 3, \ldots\}$
   - (b) $\left\{\frac{a}{b}\right\}$ where a, b are any number in set (A) and $b \neq 0$
   - (c) {non-terminating and non-repeating decimals}
   - (d) {set (b), set (c)}
2. Why is the expression $b \neq 0$ part of #1 (b)?
3. Name the sets of numbers to which each number belongs:
   - (A) 5 (b) $\frac{1}{5}$ (c) $\sqrt{5}$ (d) 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 / (+)(−)

•, ÷ SPDN

Fraction Rules

+, − Common Denominator

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

÷ flip and multiply

Homework review: Convert to fractions: $.\overline{8}$, $0.\overline{24}$, $.00\overline{1}$.

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 $N = 0.\overline{24}$

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

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

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

③ $0.00\overline{1}$ Let $N = 0.00\overline{1} = 0.00111111\ldots$

$1000N = 1.11111111\ldots$

$-N \quad -.00\overline{1}$

$999N = 1.11$

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

TIP: The "Heart" Division

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

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

OR

$\frac{1(12x+6)}{3} = \frac{1}{3}(12x+6) = \frac{12x}{3} + \frac{6}{3}$

$= \boxed{4x+2}$ ✓

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 ⇒ [ALL REAL NUMBERS]
- If the equation is FALSE ⇒ [NO SOLUTION]

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

$3d - 24 - 3d$

$-3d \qquad -3d$ ← VARIABLE "GOES AWAY"!

$-24 = 0$ FALSE ∴ [NO SOLUTION]

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

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

$3a - 2 = 3a - 2$

$-3a \qquad -3a$

$-2 = -2$ TRUE ∴ [ALL REAL NUMBERS]

Your turn: Solve:

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

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

$$16-16K = -10-16K$$
$$+16K \qquad +16K$$

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

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.

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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:

$$d = rt$$

distance = rate • time

(Ex) 600 miles = $60 \frac{\text{miles}}{\text{hour}}$ • 10 hours

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

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

miles = miles ✓

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

↑ (d is by itself)

(EX) Given: $d = rt$, solve for t

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

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

(EX) 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: $\boxed{d = rt}$ (EX) $600\text{ mi} = 60\frac{\text{mi}}{\text{hr}} \cdot 10\text{ hr}$

or $\boxed{t = \frac{d}{r}}$ (EX) $10\text{ hr} = \frac{600\text{ mi}}{60\frac{\text{mi}}{\text{hr}}}$

or $\boxed{r = \frac{d}{t}}$ (EX) $60\frac{\text{mi}}{\text{hr}} = \frac{600\text{ mi}}{10\text{ hr}}$

Homework:

① Page 152 #27, 28

② Page 168 #13 to 16.