

QUIZ #1 @ 85 points

Write in a neat and organized fashion. Write your complete solutions on SEPARATE PAPER. You should use a pencil. For an exercise to be complete there needs to be a detailed solution to the problem. Do not just write down an answer. No proof, no credit given! Clearly label each exercise.

1. Give two numbers between -10 and 10 that satisfy each given condition:

a) integer numbers

b) irrational numbers

c) rational numbers but not integers

2. Simplify the following expressions:

a) $-8(2y-1) + \frac{1}{2}(6-4y) - y + 1$

b) $7 - 5[x - 2(x+1)]$

3. Solve the following equations .

a) $-5(2m+3) - 4m = 8m + 27$

d) $\frac{y+7}{5} = \frac{1-3y}{4}$

b) $-\frac{1}{4}(x-12) + \frac{1}{2}(x+2) = x + 4$

e) $2x + 3y = 5$ solve for y .

c) $11x - 5(x+2) = 6x + 5$

f) $V = \frac{1}{3}\pi r^2 h$ solve for h .

4. Solve the following inequalities. Graph the solution set. Write the solution set using interval notation.

a) $-1 \leq 2x - 3 < 7$

b) $\frac{7}{9}(y-4) \leq \frac{4}{3}(y+5)$

5. A bank teller has 25 more \$5 bills than \$10 bills. The total value of the money is \$200. How many of each denomination of bill does she have?

6. The longest side of a triangle is 3 ft longer than the shortest side. The medium side is 1 ft longer than the shortest side. If the perimeter of the triangle is 16 ft, what are the lengths of the three sides?

M51

Quiz 1

(1) For example,

(a) -3 and 5

(b) $-\sqrt{2}$ and $\sqrt{6}$

(c) 2.1 and $-\frac{2}{3}$

(2)

$$\begin{aligned} \text{(a)} \quad & -8(2y-1) + \frac{1}{2}(6-4y) - y + 1 \\ & = -16y + 8 + 3 - 2y - y + 1 \\ & = -19y + 12 \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad & 7 - 5[x - 2(x+1)] = \\ & = 7 - 5(x - 2x - 2) \\ & = 7 - 5(-x - 2) \\ & = 7 + 5x + 10 \\ & = 5x + 17 \end{aligned}$$

(3)

$$\begin{aligned} \text{(a)} \quad & -5(2m+3) - 4m = 8m + 27 \\ & -10m - 15 - 4m = 8m + 27 \\ & -14m - 15 = 8m + 27 \\ & -14m - 8m = 27 + 15 \\ & -22m = 42 \\ & m = \frac{42}{-22} = \frac{21}{-11} \\ & m \in \left\{ -\frac{21}{11} \right\} \end{aligned}$$

$$\text{(b)} \quad -\frac{1}{4}(x-12) + \frac{1}{2}(x+2) = x+4$$

$$\text{LCD} = 4$$

$$\frac{-(x-12)}{4} + \frac{2(x+2)}{4} = \frac{4(x+4)}{4}$$

$$-(x-12) + 2(x+2) = 4(x+4)$$

$$-x+12 + 2x+4 = 4x+16$$

$$x+16 = 4x+16$$

$$x = 4x$$

$$x - 4x = 0$$

$$-3x = 0 \Rightarrow x = 0$$

$$x \in \{0\}$$

$$\begin{aligned} \text{(c)} \quad & 11x - 5(x+2) = 6x + 5 \\ & 11x - 5x - 10 = 6x + 5 \\ & 6x - 10 = 6x + 5 \\ & -10 = 5 \quad \text{contradiction} \\ & \Rightarrow \text{no solutions} \\ & x \in \emptyset \end{aligned}$$

$$\text{(d)} \quad \frac{y+7}{5} = \frac{1-3y}{4}$$

Apply the cross-product property

$$4(y+7) = 5(1-3y)$$

$$4y + 28 = 5 - 15y$$

$$4y + 15y = 5 - 28$$

$$19y = -23$$

$$y = \frac{-23}{19}$$

$$y \in \left\{ \frac{-23}{19} \right\}$$

(c) $2x + 3y = 5, y = ?$

$$3y = -2x + 5$$

$$y = \frac{-2x + 5}{3}$$

(f) $V = \frac{1}{3} \pi r^2 h, h = ?$

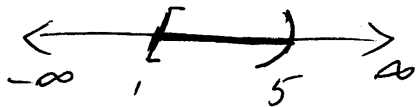
$$3V = \pi r^2 h$$

$$h = \frac{3V}{\pi r^2}$$

(4) $-1 \leq 2x - 3 < 7$
+3 +3 +3

(a) $2 \leq 2x < 10$ $\div 2$

$$1 \leq x < 5$$



$$x \in [1, 5)$$

(6) $\frac{7}{9}(y-4) \leq \frac{4}{3}(y+5) \quad / \cdot 9$

$$LCO = 9$$

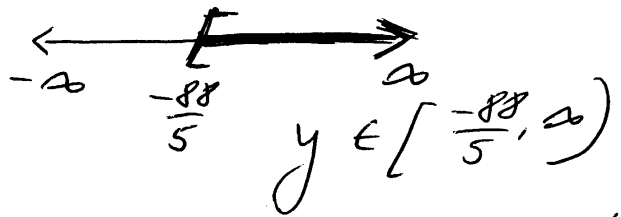
$$7(y-4) \leq 12(y+5)$$

$$7y - 28 \leq 12y + 60$$

$$-28 - 60 \leq 12y - 7y$$

$$-88 \leq 5y$$

$$\frac{-88}{5} \leq y \Rightarrow y \geq \frac{-88}{5}$$



(5) Example textbook

let $x =$ number of \$10 bills
then $x + 25 =$ number of \$5 bills

$$10x + 5(x + 25) = 200$$

$$10x + 5x + 125 = 200$$

$$15x + 125 = 200$$

$$15x = 200 - 125$$

$$15x = 75$$

$$x = \frac{75}{15}$$

$$x = 5, \text{ then } x + 25 = 30$$

There are five \$10 bills
and thirty \$5 bills

(6) Example textbook

let x = length of the shortest side
then $x+3$ = length of the longest side
then $x+1$ = length of the medium side

$$\text{Perimeter} = 16 \text{ ft}$$

$$x + (x+3) + (x+1) = 16$$

$$x + x + 3 + x + 1 = 16$$

$$3x + 4 = 16$$

$$3x = 16 - 4$$

$$3x = 12$$

$$x = \frac{12}{3}$$

$$x = 4 \text{ ft}$$

The sides are 4 ft - shortest
5 ft - medium
7 ft - longest