

MTHS100 - Assignment 2

Question 1.

$$\begin{aligned}(15 / (105 - 102) + 3) * 20 &= \\(15 / 3 + 3) * 20 &= \\(5 + 3) * 20 &= \\8 * 20 &= 160\end{aligned}$$

Question 2.

- a) Improper
- b) Mixed
- c) Proper
- d) Improper

Question 3.

$$\begin{array}{r} \text{a) } 70/9 = \\ \quad 07\text{r}7 \\ 9 \overline{)70} \\ \underline{0} \\ 70 \\ \underline{63} \\ 7 \\ = 7 \frac{7}{9} \end{array}$$

$$\begin{array}{r} \text{b) } -315/31 = \\ \quad 01\text{r}5 \\ 31 \overline{)315} \\ \underline{0} \\ 31 \\ \underline{31} \\ 05 \\ = 10 \frac{5}{31} \end{array}$$

Question 4.

$$\begin{aligned}\text{a) } 7 \frac{1}{3} &= 7 \times 3 + 1 \\ &= 21 + 1 \\ &= 22/3\end{aligned}$$

$$\begin{aligned}\text{b) } -5 \frac{7}{12} &= -5 \times 12 + -7 \\ &= -60 + 7 \\ &= -67/12\end{aligned}$$

Question 5.

$$\begin{aligned}\text{a) } 70/49 &= 7 \times 10 = 70 \text{ and} \\ &= 7 \times 7 = 49, \\ &= 10/7\end{aligned}$$

$$\begin{aligned}\text{b) } -75/15 &= -15 \times 5 = -75 \text{ and,} \\ &= 3 \times 5 = 15, \\ &= -15/3 \\ &= -5/1 \\ &= -5\end{aligned}$$

Question 6.

a) $5/7 - 5/14$,

First we get a common denominator, multiplying top and bottom of the first fraction by 2 gives us,

$$10/14 - 5/14,$$

Now we do subtraction,

$$10 - 5 = 5/14$$

b) $(3/40 + 1/30) \times 110$

We need a common denominators multiplying the first fraction by 3 will give us,
 $9/120$

and the second by 4 will give us,

$$4/120,$$

now we add the fractions,

$$13/120 \times 110 = 1430/120,$$

Now we simplify, using prime factorization, 1430 is made up of $2 \times 5 \times 11 \times 13$ and 120 is made up of $2 \times 2 \times 2 \times 3 \times 5$, both numbers share a 2 and a 5, multiplying them together gives us 10, now we simply divide the top and bottom by 10 give us,
 $143/12$

c) $14/84 - 3/8 \div 9/4$,

First we get rid of the division by flipping the $9/4$ and then multiplying it,
 $= 3/8 \times 4/9 = 3 \times 4$ and $8 \times 9 = 12/72$,

Now we do the subtraction,

$$14/84 - 12/72,$$

Simplify both fractions,

$$14/84 \div 2 = 7/42 \div 7 = 1/6$$

$$12/72 \div 6 = 2/12 \div 2 = 1/6$$

$$1/6 - 1/6 = 0$$

Question 7.

a) $-2/5$ and $-1/2$

Find the common denominator,

$$-2/5 \times 2 = -4/10$$

$$-1/2 \times 5 = -5/10$$

Compare,

$$-4/10 > -5/10$$

b) $5/6$ and $7/8$

Find the common denominator,

$$5/6 \times 4 = 20/24$$

$$7/8 \times 3 = 21/24$$

Compare,

$$20/24 < 21/24$$

Question 8.

$$a/b + c/d / 2$$

$$= -2/3 + 3/2 / 2$$

Find the common denominator

$$= -2/3 \times 2 = -4/6, \text{ and } 3/2 \times 3 = 9/6$$

$$= -4/6 + 9/6 / 2$$

$$= 5/6 / 2$$

Flip the dividing fraction and multiply

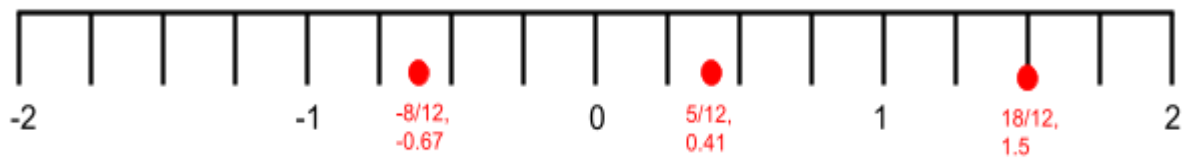
$$= 5/6 \times 1/2 =$$

$$5/12$$

Now for the number line, it will be easier to take the two numbers that made up the average and express them over the same denominator as the average. This means multiplying both of them by two, giving us out three numbers of:

$$-8/12, 5/12, 18/12$$

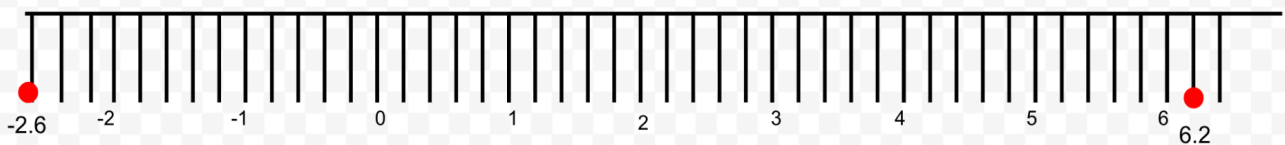
Now we just pick a scale and plot them on the number line.



Question 9.

a) -2.6

b) 6.2



Question 10.

$$A^2 + b^2 = c^2$$

$$6 \times 6 + 5 \times 5 = c^2$$

$$36 + 25 = c^2$$

$$61 = c^2$$

$$\sqrt{61} = c$$

$$= 7.810\text{cm}$$

Question 11.

$$\begin{aligned}C &= 2 \times \pi \times r \\&= 2 \times 3.14 \\&= 6.28 \times 4.12 \\ \text{Circumference} &= 25.87\end{aligned}$$

$$\begin{aligned}A &= \pi \times R^2 \\&= 3.14 \times 4.12^2 \\&= 3.14 \times 16.97 \\ \text{Area} &= 53.32\end{aligned}$$

Question 12.

$$\begin{array}{r}7/8 \\= 0.875 \\8 \overline{)7} \\0 \\70 \\64 \\60 \\56 \\40\end{array}$$

$$\begin{array}{r}16/7 \\= 2.285714 \\7 \overline{)16.} \\14 \\20 \\14 \\60 \\56 \\40 \\35 \\50 \\49 \\10 \\7 \\30 \\28 \\2\end{array}$$

And the number repeats

Question 13.

- a) $0.72 = 72/100 = 36/50 = 18/25$
- b) $-0.999 = -999/1000$
- c) $9.31 = 9 \text{ \& } 31/100$

Question 14.

- a) $-\sqrt{2} = -1.41$
 $2/3 = 0.67$
 $-1.41 < x \leq 0.67$, This is a semi-open interval
- b) $1/3 = 0.33$ and 2
- c) $A \cup B = (-1.41, 2]$
 $A \cap B = [0.33, 0.67]$
- d) Does 0.67 belong to:
 - A = Yes
 - B = Yes
 - $A \cup B$ = Yes
 - $A \cap B$ = Yes
 - $B \setminus A$ = No

