



#### Linear Inequations Ex 15.4 Q9

Let the length of the shortest side be  $x$ .

Then, the length of the longest side and third side of the triangle are  $3x$  and  $3x - 2$  respectively.

According to question,  
perimeter of triangle  $\geq 61$

$$\Rightarrow x + 3x - 2 + 3x \geq 61$$

$$\Rightarrow 7x \geq 61 + 2$$

$$\Rightarrow 7x \geq 63$$

$$\Rightarrow x \geq \frac{63}{7}$$

$$\Rightarrow x \geq 9$$

$\therefore$  The minimum length of the shortest side is 9cm.

#### Linear Inequations Ex 15.4 Q10

Let the quantity of water to be added to solution =  $x$  liters.

$$\therefore 25\%(1125 + x) < 45\% \text{ of } 1125$$

$$\Rightarrow \frac{25}{100}(1125 + x) < \frac{45}{100} \times 1125$$

$$\Rightarrow 1125 + x < \frac{45}{25} \times 1125$$

$$\Rightarrow 1125 + x < 45 \times 45$$

$$\Rightarrow 1125 + x < 2025$$

$$\Rightarrow x < 2025 - 1125$$

$$\Rightarrow x < 900$$

$$\text{and } 45\% \text{ of } 1125 < 30\%(1125 + x)$$

$$\Rightarrow \frac{45}{100} \times 1125 < \frac{30}{100}(1125 + x)$$

$$\Rightarrow \frac{45}{30} \times 1125 < 1125 + x$$

$$\Rightarrow \frac{3}{2} \times 1125 < 1125 + x$$

$$\Rightarrow 1.5 \times 1125 < 1125 + x$$

$$\Rightarrow 1687.5 < 1125 + x$$

$$\Rightarrow 1687.5 - 1125 < x$$

$$\Rightarrow 562.5 < x \dots\dots\dots (ii)$$

Using (i) and (ii), we get  $562.5 < x < 900$

Hence, quantity of water lies between 562.5 litres and 900 litres.

#### Linear Inequations Ex 15.4 Q11

Let  $x$  liters of 2% solution will have to be added to 640 liters of the 8% solution of acid.

Total quantity of mixture =  $(640+x)$

Total acid in the  $(640+x)$  liters of mixture

$$\frac{2}{100}x + \frac{8}{100}640$$

It is given that acid content in the resulting mixture must be more than 4% but less than 6%.

$$\frac{4}{100}[640+x] < \left( \frac{2}{100}x + \frac{8}{100}640 \right) < \frac{6}{100}[640+x]$$

$$\Rightarrow 4[640+x] < (2x+8640) < 6[640+x]$$

$$\Rightarrow 2560 + 4x < 2x + 8640 \text{ and } 2x + 8640 < 3840 + 6x$$

$$\Rightarrow 2560 - 8640 < 2x - 4x \text{ and } 2x - 6x < 3840 - 8640$$

$$\Rightarrow x < 1280 \text{ and } x > 320$$

**More than 320 litres but less than 1280 liters of 2% is to be added.**

Linear Inequations Ex 15.4 Q12

Let the pH value of third reading be  $x$ .

$$\therefore 7.2 < \frac{7.48 + 7.85 + x}{3} < 7.8$$

$$\Rightarrow 21.6 < 7.48 + 7.85 + x < 23.4$$

$$\Rightarrow 21.6 < 15.33 + x < 23.4$$

$$\Rightarrow 21.6 - 15.33 < x < 23.4 - 15.33$$

$$\Rightarrow 6.27 < x < 8.07$$

$\therefore$  The range of pH value for the third reading is lies between 6.27 and 8.07.

\*\*\*\*\* END \*\*\*\*\*