

$$1) \quad \frac{x+y}{y} = \frac{13}{8} \Rightarrow \frac{x}{y} + \frac{y}{y} = \frac{13}{8} \Rightarrow \frac{x}{y} + 1 = \frac{13}{8}$$

$$\frac{x}{y} = \frac{13}{8} - 1 = \frac{5}{8}$$

$$\frac{x}{y} = \frac{5}{8}, \quad x = 5k, \quad y = 8k$$

$$\therefore 2x + 3y = 34$$

$$2(5k) + 3(8k) = 34$$

$$10k + 24k = 34$$

$$34k = 34$$

$$k = 1 \quad \dots, \quad x = 5, \quad y = 8$$

$$\dots 7x + 5y$$

$$= 7(5) + 5(8)$$

$$= 75$$

option (c) 75

$$2) \quad \frac{(5-2x)}{3} \leq \frac{x}{6} - 5$$

$$\text{multiply by 6: } 6 \left(\frac{5-2x}{3} \right) \leq 6 \left(\frac{x}{6} - 5 \right)$$

$$2(5-2x) \leq x-30$$

$$10-4x \leq x-30$$

$$5x \geq 40$$

$$x \geq 8$$

option (A) $x \geq 8$

3)

$$\sqrt{5 + \sqrt{5 + \sqrt{5 + \dots \infty}}}$$

$$x = \sqrt{5 + \sqrt{5 + \sqrt{5 + \dots \infty}}}$$

Squaring both side

$$x^2 = 5 + \sqrt{5 + \sqrt{5 + \dots \infty}}$$

put this as x .

$$x^2 = 5 + x$$

$$x^2 - x - 5 = 0$$

$$a = 1, b = -1, c = -5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4 \times 1 \times (-5)}}{2(1)}$$

$$x = \frac{1 \pm \sqrt{1 + 20}}{2}$$

$$x = \frac{1 \pm \sqrt{21}}{2}$$

$$\text{option (B)} \quad \frac{1 + \sqrt{21}}{2}$$

$$4) \quad \frac{(5 - 2x)}{4} \leq \frac{x}{8} - 5 \quad \text{and} \quad \frac{(x + 4)}{3} \leq 6$$

$$1) \text{ multiply by } 8 : \frac{8(5 - 2x)}{4} \leq 8\left(\frac{x}{8} - 5\right)$$

$$2(5 - 2x) \leq x - 40$$

$$10 - 4x \leq x - 40$$

$$5x \geq 50$$

$$x \geq 10$$

$$2) \frac{(x+4)}{3} \leq 6$$

$$x+4 \leq 6 \times 3$$

$$x+4 \leq 18$$

$$x \leq 14$$

$$10 \leq x \leq 14$$

$$\therefore \text{option (c) } 10 \leq x \leq 14$$