

$$34. (2) \text{ S.I.} = \frac{5000 \times 6 \times 146}{100 \times 365} = ₹ 120$$

$$35. (1) \therefore A - P \left(1 + \frac{r}{100}\right)^2$$

$$\therefore 12100 - P \left(1 + \frac{10}{100}\right)^2$$

$$\Rightarrow P = \frac{12100 \times 100 \times 100}{110 \times 110}$$

$$= ₹ 10,000$$

$$36. (4) \text{ Average age of the family} = \frac{\text{age of grandparents} + \text{age of parents} + \text{age of children}}{\text{Total Members}}$$

$$\frac{67 \times 2 + 35 \times 2 + 6 \times 3}{2 + 2 + 3}$$

$$= \frac{222}{7} = 31\frac{5}{7} \text{ years}$$

$$37. (3) \text{ Expenditure for materials \& taxes together}$$

$$= (22 + 36)\% \text{ of } 500$$

$$= 58\% \text{ of } 500$$

$$= 0.58 \times 500$$

$$= ₹ 290 \text{ crores}$$

$$38. (3) \text{ Required angle} = \frac{36}{100} \times 100 \times$$

$$360^\circ = 129.6^\circ$$

$$39. (4) 25 = x\% \text{ of } 22$$

$$\Rightarrow x = \frac{25 \times 100}{22} = 113.64$$

$$40. (1) \text{ Required amount}$$

$$= 13\% \text{ of } 500 - 4\% \text{ of } 500$$

$$= ₹ 45 \text{ crores}$$

$$41. (1) \text{ No. of bricks} =$$

$$\frac{\text{volume of the wall}}{\text{volume of one brick}}$$

$$= \frac{(25 \times 100)(2 \times 100) \left(\frac{3}{4} \times 100\right)}{20 \times 10 \times \frac{15}{2}}$$

$$= 25000$$

$$42. (1) \text{ Radius of the garden} = 31 \text{ m}$$

$$\text{Width of the fencing wall} = 2 \text{ m}$$

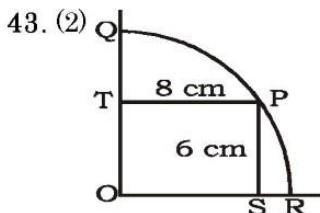
$$\text{Area of the land required by the wall}$$

$$= \pi |r_0^2 - r_1^2| = \pi |33^2 - 31^2|$$

$$= \pi (33 + 31)(33 - 31)$$

$$= \pi \times 64 \times 2$$

$$= 128\pi \text{ m}^2$$



$$\text{From the figure } OP = \sqrt{6^2 + 8^2} = 10 \text{ cm}$$

$$\text{length of the arc OR} = \frac{\pi r \theta}{180}$$

$$\frac{\pi \times 10 \times 90}{180}$$

$$= 5\pi \text{ cm}$$

$$44. (4) \text{ In } \triangle ABC$$

$$\tan 30^\circ = \frac{BC}{AB}$$

$$\frac{1}{\sqrt{3}} = \frac{2\sqrt{3}}{AB} \Rightarrow AB = 6 \text{ cm}$$

$$\angle ABD = 60^\circ$$

$$\text{In } \triangle ABD$$

$$\tan 60^\circ = \frac{AD}{AB}$$

$$\sqrt{3} = \frac{AD}{6} \Rightarrow AD = 6\sqrt{3} \text{ cm}$$

$$45. (3) \frac{a}{b} = \frac{\sqrt{5}+1}{\sqrt{5}-1} \times \frac{\sqrt{5}+1}{\sqrt{5}-1} = \frac{(\sqrt{5}+1)^2}{(\sqrt{5}-1)^2}$$

$$= \frac{5+1+2\sqrt{5}}{5+1-2\sqrt{5}} = \frac{6+2\sqrt{5}}{6-2\sqrt{5}}$$

$$\Rightarrow \frac{a}{b} = \frac{3+\sqrt{5}}{3-\sqrt{5}}$$

Applying componendo & dividendo, we have

$$\frac{a+b}{a-b} = \frac{3+\sqrt{5}+3-\sqrt{5}}{(3+\sqrt{5})-(3-\sqrt{5})}$$

$$= \frac{6}{2\sqrt{5}} = \frac{3}{\sqrt{5}}$$

$$\Rightarrow \left(\frac{a-b}{a+b}\right)^2 = \left(\frac{\sqrt{5}}{3}\right)^2 = \frac{5}{9}$$

$$46. (4) \frac{c}{2c+z} + \frac{b}{2b+y} + \frac{a}{2a+x}$$

$$= \frac{cz}{2cz+z^2} + \frac{by}{2by+y^2} + \frac{ax}{2ax+x^2}$$

$$= \frac{cz}{2cz+2(ax+by)} + \frac{by}{2by+2(cz+ax)}$$

$$+ \frac{ax}{2ax+2(by+cz)}$$

$$= \frac{1}{2} \left[\frac{cz}{ax+by+cz} + \frac{by}{ax+by+cz} + \frac{ax}{ax+by+cz} \right]$$

$$= \frac{1}{2} \left[\frac{ax+by+cz}{ax+by+cz} \right] = \frac{1}{2}$$

$$47. (2) \frac{x^4+1}{x^5-\frac{1}{x}} = \frac{x^4+1}{x^5+\frac{1}{x}} = \frac{x^2-\frac{1}{x^2}}{x^3-\frac{1}{x^3}}$$

$$= \frac{\left(x - \frac{1}{x^2}\right)^3 + 2}{\left(x - \frac{1}{x}\right)^2 + \left(x - \frac{1}{x}\right)}$$

$$= \frac{3^2+2}{3^3+9} = \frac{11}{36}$$

$$48. (2) \text{ Total age of remaining 29 boys}$$

$$= 30 \times 15 - 20$$

$$= 450 - 20 = 430$$

Suppose the age of two new boys be x years and $(x+5)$ years

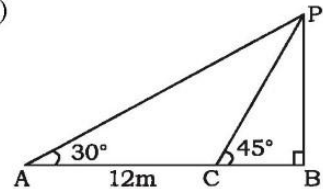
then, $430 + x + x + 5 = 15 \times 31$

$$2x = 465 - 435 = 30$$

$$\Rightarrow x = 15 \text{ years}$$

The age of younger boy = 15 years

$$49. (1)$$



In $\triangle PBC$

$$\tan 45^\circ = \frac{PB}{BC}$$

$$PB = BC$$

In $\triangle PBA$

$$\frac{PB}{AB} = \tan 30^\circ$$

$$\frac{PB}{12+PB} = \frac{1}{\sqrt{3}} \Rightarrow PB = \frac{12}{\sqrt{3}-1}$$

$$= 6(\sqrt{3}+1) \text{ m} = 6 \times 2.732$$

$$= 16.4 \text{ m}$$

$$50. (1) \tan 15^\circ \tan 45^\circ \tan 60^\circ \tan 75^\circ$$

$$\tan 15^\circ \tan 75^\circ \tan 45^\circ \tan 60^\circ$$

$$\tan 15^\circ \tan (90^\circ - 15^\circ) \tan 45^\circ \tan 60^\circ$$

$$= \tan 15^\circ \cot 15^\circ \tan 45^\circ \tan 60^\circ$$

$$= 1 \times 1 \times \sqrt{3} = \sqrt{3}$$