

# Percentage

## Exercise 10A

Q1

**Answer :**

We have the following:

$$(i) \frac{47}{100} = \left( \frac{47}{100} \times 100 \right) \% = 47\%$$

$$(ii) \frac{9}{20} = \left( \frac{9}{20} \times 100 \right) \% = (9 \times 5) \% = 45\%$$

$$(iii) \frac{3}{8} = \left( \frac{3}{8} \times 100 \right) \% = \left( \frac{3 \times 25}{2} \right) \% = \left( \frac{75}{2} \right) \% = 37 \frac{1}{2} \%$$

$$(iv) \frac{8}{125} = \left( \frac{8}{125} \times 100 \right) \% = \left( \frac{8 \times 4}{5} \right) \% = \left( \frac{32}{5} \right) \% = 6.4\%$$

$$(v) \frac{19}{500} = \left( \frac{19}{500} \times 100 \right) \% = \left( \frac{19}{5} \right) \% = 3.8\%$$

$$(vi) \frac{4}{15} = \left( \frac{4}{15} \times 100 \right) \% = \left( \frac{4 \times 20}{3} \right) \% = \left( \frac{80}{3} \right) \% = 26 \frac{2}{3} \%$$

$$(vii) \frac{2}{3} = \left( \frac{2}{3} \times 100 \right) \% = \left( \frac{200}{3} \right) \% = 66 \frac{2}{3} \%$$

$$(viii) 1 \frac{3}{5} = \frac{8}{5} = \left( \frac{8}{5} \times 100 \right) \% = (8 \times 20) \% = 160\%$$

Q2

**Answer :**

We have the following:

$$(i) 32\% = \left( \frac{32}{100} \right) = \frac{8}{25}$$

$$(ii) 6 \frac{1}{4} \% = \left( \frac{25}{4} \right) \% = \left( \frac{25}{4} \times \frac{1}{100} \right) = \frac{1}{16}$$

$$(iii) 26 \frac{2}{3} \% = \left( \frac{80}{3} \right) \% = \left( \frac{80}{3} \times \frac{1}{100} \right) = \left( \frac{4 \times 1}{3 \times 5} \right) = \frac{4}{15}$$

$$(iv) 120\% = \left( \frac{120}{100} \right) = \frac{6}{5} = 1 \frac{1}{5}$$

$$(v) 6.25\% = \left( \frac{6.25}{100} \right) = \left( \frac{625}{100 \times 100} \right) = \left( \frac{25}{400} \right) = \frac{1}{16}$$

$$(vi) 0.8\% = \left( \frac{0.8}{100} \right) = \left( \frac{8}{10 \times 100} \right) = \left( \frac{8}{1000} \right) = \frac{1}{125}$$

$$(vii) 0.06\% = \left( \frac{0.06}{100} \right) = \left( \frac{6}{100 \times 100} \right) = \left( \frac{6}{10000} \right) = \frac{3}{5000}$$

$$(viii) 22.75\% = \left( \frac{22.75}{100} \right) = \left( \frac{2275}{100 \times 100} \right) = \frac{91}{400}$$

Q3

**Answer :**

We have:

$$(i) 43\% = \frac{43}{100} = 43 : 100$$

$$(ii) 36\% = \frac{36}{100} = \frac{9}{25} = 9 : 25$$

$$(iii) 7.5\% = \left(\frac{7.5}{100}\right) = \left(\frac{75}{10 \times 100}\right) = \frac{3}{40} = 3 : 40$$

$$(iv) 125\% = \frac{125}{100} = \frac{5}{4} = 5 : 4$$

Q4

**Answer :**

We have the following:

$$(i) 37 : 100 = \frac{37}{100} = \left(\frac{37}{100} \times 100\right)\% = 37\%$$

$$(ii) 16 : 25 = \frac{16}{25} = \left(\frac{16}{25} \times 100\right)\% = (16 \times 4)\% = 64\%$$

$$(iii) 3 : 5 = \frac{3}{5} = \left(\frac{3}{5} \times 100\right)\% = (3 \times 20)\% = 60\%$$

$$(iv) 5 : 4 = \frac{5}{4} = \left(\frac{5}{4} \times 100\right)\% = (5 \times 25)\% = 125\%$$

Q5

**Answer :**

We have the following:

$$(i) 45\% = \left(\frac{45}{100}\right) = 0.45$$

$$(ii) 127\% = \left(\frac{127}{100}\right) = 1.27$$

$$(iii) 3.6\% = \left(\frac{3.6}{100}\right) = \left(\frac{36}{10 \times 100}\right) = \frac{36}{1000} = 0.036$$

$$(iv) 0.23\% = \left(\frac{0.23}{100}\right) = \left(\frac{23}{100 \times 100}\right) = \frac{23}{10000} = 0.0023$$

Q6

**Answer :**

We have:

- (i)  $0.6 = (0.6 \times 100)\% = 60\%$
- (ii)  $0.42 = (0.42 \times 100)\% = 42\%$
- (iii)  $0.07 = (0.07 \times 100)\% = 7\%$
- (iv)  $0.005 = (0.005 \times 100)\% = 0.5\%$

Q7

**Answer :**

We have:

- (i)  $32\% \text{ of } 425 = \left(\frac{32}{100} \times 425\right) = \left(\frac{32 \times 17}{4}\right) = (8 \times 17) = 136$
- (ii)  $16\frac{2}{3}\% \text{ of } 16 = \frac{50}{3}\% \text{ of } 16 = \left(\frac{50}{3 \times 100} \times 16\right) = \left(\frac{1}{6} \times 16\right) = \frac{8}{3} = 2\frac{2}{3}$
- (iii)  $6.5\% \text{ of } 400 = \left(\frac{6.5}{100} \times 400\right) = \left(\frac{65}{10 \times 100} \times 400\right) = \left(\frac{65 \times 4}{10}\right) = \frac{260}{10} = 26$
- (iv)  $136\% \text{ of } 70 = \left(\frac{136}{100} \times 70\right) = \left(\frac{136 \times 7}{10}\right) = \left(\frac{952}{10}\right) = 95.2$
- (v)  $2.8\% \text{ of } 35 = \left(\frac{2.8}{100} \times 35\right) = \left(\frac{28}{10 \times 100} \times 35\right) = \left(\frac{14 \times 7}{100}\right) = \frac{98}{100} = 0.98$
- (vi)  $0.6\% \text{ of } 45 = \left(\frac{0.6}{100} \times 45\right) = \left(\frac{6}{10 \times 100} \times 45\right) = \left(\frac{3 \times 45}{5 \times 100}\right) = \left(\frac{3 \times 9}{100}\right) = \frac{27}{100} = 0.27$

Q8

**Answer :**

We have the following:

- (i)  $25\% \text{ of Rs } 76 = \text{Rs } \left(76 \times \frac{25}{100}\right) = \text{Rs } \left(76 \times \frac{1}{4}\right) = \text{Rs } 19$
- (ii)  $20\% \text{ of Rs } 132 = \text{Rs } \left(132 \times \frac{20}{100}\right) = \text{Rs } \left(132 \times \frac{1}{5}\right) = \text{Rs } 26.4$
- (iii)  $7.5\% \text{ of } 600 \text{ m} = \left(600 \times \frac{7.5}{100}\right) \text{ m} = (6 \times 7.5) \text{ m} = 45 \text{ m}$
- (iv)  $3\frac{1}{3}\% \text{ of } 90 \text{ km} = \frac{10}{3}\% \text{ of } 90 \text{ km} = \left(90 \times \frac{10}{3 \times 100}\right) \text{ km} = \left(90 \times \frac{1}{30}\right) \text{ km} = 3 \text{ km}$
- (v)  $8.5\% \text{ of } 5 \text{ kg} = \left(5 \times \frac{8.5}{100}\right) \text{ kg} = \left(5 \times \frac{85}{1000}\right) \text{ kg} = 0.425 \text{ kg} = 425 \text{ g} \quad [\because 1 \text{ kg} = 1000 \text{ g}]$
- (vi)  $20\% \text{ of } 12 \text{ L} = \left(12 \times \frac{20}{100}\right) \text{ L} = \left(12 \times \frac{1}{5}\right) \text{ L} = 2.4 \text{ L}$

Q9

**Answer :**

Let x be the required number.

Then,  $13\% \text{ of } x = 65$

$$\Rightarrow \left(\frac{13}{100} \times x\right) = 65$$

$$\Rightarrow x = \left(65 \times \frac{100}{13}\right) = 500$$

Hence, the required number is 500.

Q10

**Answer :**

Let  $x$  be the required number.

Then,  $6\frac{1}{4}\%$  of  $x = 2$

$$\Rightarrow \left(6\frac{1}{4}\% \times x\right) = 2$$

$$\Rightarrow \left(\frac{25}{400} \times x\right) = 2$$

$$\Rightarrow x = \left(2 \times \frac{400}{25}\right) = 32$$

Hence, the required number is 32.

Q11

**Answer :**

$$10\% \text{ of Rs } 90 = \text{Rs } \left(\frac{10}{100} \times 90\right) = \text{Rs } 9$$

$$\therefore \text{Amount that is } 10\% \text{ more than Rs } 90 = \text{Rs } (90 + 9) = \text{Rs } 99$$

Hence, the required amount is Rs 99.

Q12

**Answer :**

$$20\% \text{ of Rs } 60 = \text{Rs } \left(60 \times \frac{20}{100}\right) = \text{Rs } 12$$

$$\therefore \text{Amount that is } 20\% \text{ less than Rs } 60 = \text{Rs } (60 - 12) = \text{Rs } 48$$

Hence, the required amount is Rs 48.

Q13

**Answer :**

3% of  $x = 9$

$$\Rightarrow \left(\frac{3}{100} \times x\right) = 9$$

$$\Rightarrow x = \left(9 \times \frac{100}{3}\right) = 300$$

Hence, the value of  $x$  is 300.

Q14

**Answer :**

12.5% of  $x = 6$

$$\Rightarrow \left(\frac{12.5}{100} \times x\right) = 6$$

$$\Rightarrow x = \left(6 \times \frac{100}{12.5}\right) = (6 \times 8) = 48$$

Hence, the value of  $x$  is 48.

Q15

**Answer :**

Let  $x\%$  of 84 be 14.

$$\text{Then, } \left(\frac{x}{100} \times 84\right) = 14$$

$$\Rightarrow \frac{21x}{25} = 14$$

$$\Rightarrow x = \left(14 \times \frac{25}{21}\right) = \left(\frac{2 \times 25}{3}\right) = \frac{50}{3} = 16\frac{2}{3}\%$$

Hence,  $16\frac{2}{3}\%$  of 84 is 14.

Q16

**Answer :**

(i) Let  $x\%$  of Rs 120 be Rs 15.

$$\text{Then, Rs } \left( \frac{x}{100} \times 120 \right) = \text{Rs } 15$$

$$\Rightarrow \left( \frac{6x}{5} \right) = 15$$

$$\therefore x = \left( \frac{15 \times 5}{6} \right) \% = \left( \frac{25}{2} \right) \% = 12.5\%$$

Hence, 12.5% of Rs 120 is Rs 15.

(ii) Let  $x\%$  of 2 h be 36 min.

$$\text{Then, } \left( \frac{x}{100} \times 2 \times 60 \right) \text{ min} = 36 \text{ min}$$

$$\Rightarrow \left( \frac{120x}{100} \right) = 36$$

$$\therefore x = \left( \frac{36 \times 100}{120} \right) \% = 30\%$$

Hence, 30% of 2 h is 36 min.

(iii) Let  $x\%$  of 2 days be 8 h.

$$\text{Then, } \left( \frac{x}{100} \times 2 \times 24 \right) \text{ h} = 8 \text{ h}$$

$$\Rightarrow \left( \frac{48x}{100} \right) = 8$$

$$\therefore x = \left( \frac{8 \times 100}{48} \right) \% = 16 \frac{2}{3} \%$$

Hence,  $16 \frac{2}{3} \%$  of 2 days is 8 h.

(iv) Let  $x\%$  of 4 km be 160 m.

$$\text{Then, } \left( \frac{x}{100} \times 4 \times 1000 \right) \text{ m} = 160 \text{ m}$$

$$\Rightarrow 40x = 160$$

$$\therefore x = \left( \frac{160}{40} \right) \% = 4\%$$

Hence, 4% of 4 km is 160 m.

(v) Let  $x\%$  of 1 L be 175 mL.

$$\text{Then, } \left( \frac{x}{100} \times 1 \times 1000 \right) \text{ mL} = 175 \text{ mL}$$

$$\Rightarrow 10x = 175$$

$$\therefore x = \left( \frac{175}{10} \right) \% = 17.5\%$$

Hence, 17.5% of 1 L is 175 mL.

(vi) Let  $x\%$  of Rs 4 be 25 paise.

$$\text{Then, } \left( \frac{x}{100} \times 4 \times 100 \right) \text{ paise} = 25 \text{ paise}$$

$$\Rightarrow 4x = 25$$

$$\therefore x = \left( \frac{25}{4} \right) \% = 6 \frac{1}{4} \%$$

Hence,  $6 \frac{1}{4} \%$  of Rs 4 is 25 paise.

## Definition

Percent can be defined as  
"of one hundred."



### **PERCENTAGE:**

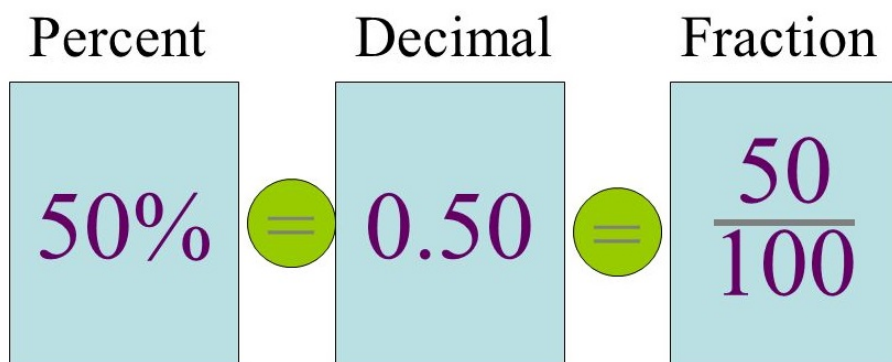
$$\frac{x}{n} \times 100 = p$$

*where:*

- x*** = given quantity
- n*** = total amount
- p*** = percentage of the quantity  
compared to the total

$$\text{Percentage increase} = \frac{\text{actual increase}}{\text{original amount}} \times 100\%$$

$$\text{Percentage decrease} = \frac{\text{actual decrease}}{\text{original amount}} \times 100\%$$



$$60\% = \frac{60}{100} = 0.6$$

Percent means "per one hundred", so to convert a percent to a fraction, divide it by 100.

Q1

**Answer :**

Maximum marks of the examination = 750

Marks secured by Rupesh = 495

Percentage of marks secured =  $\left(\frac{495}{750} \times 100\right)\% = 66\%$

Hence, Rupesh scored 66% in the examination.

Q2

**Answer :**

Total monthly salary = Rs 15625

Increase percentage = 12%

∴ Amount increase = 12% of Rs 15625

$$= \text{Rs} \left(15625 \times \frac{12}{100}\right) = \text{Rs } 1875$$

∴ New salary = Rs 15625 + Rs 1875

$$= \text{Rs } 17500$$

Hence, the new salary of the typist is Rs 17,500.

Q3

**Answer :**

Original excise duty on the item = Rs 950

Amount reduced on excise duty = Rs (950 – 760) = Rs 190

$$\begin{aligned}\therefore \text{Reduction percent} &= \left(\frac{\text{Reduction amount}}{\text{Original value}} \times 100\right) \\ &= \left(\frac{190}{950} \times 100\right) = 20\end{aligned}$$

Hence, the excise duty on that item is reduced by 20%.

Q4

**Answer :**

Let Rs  $x$  be the total cost of the TV set.

Now, 96% of the total cost of TV = Rs 10464

$$\Rightarrow 96\% \text{ of Rs } x = \text{Rs } 10464$$

$$\Rightarrow \left(\frac{96}{100} \times x\right) = 10464$$

$$\therefore x = \left(\frac{10464 \times 100}{96}\right) = 10900$$

Hence, the total cost of the TV set is Rs 10900.

Q5



**Answer :**

Let the total number of students be 100.

Then, number of boys = 70

$\therefore$  Number of girls =  $(100 - 70) = 30$

Now, total number of students when the number of girls is 30 = 100

Then, total number of students when the number of girls is 504 =  $\left(\frac{100}{30} \times 504\right) = 1680$

$\therefore$  Number of boys =  $(1680 - 504) = 1176$

Hence, there are 1176 boys in the school.

Q6

**Answer :**

Let x kg be the amount of the required ore.

Then, 12% of x kg = 69 kg

$$\Rightarrow \left(\frac{12}{100} \times x\right) \text{ kg} = 69 \text{ kg}$$

$$\Rightarrow x = \left(\frac{69 \times 100}{12}\right) \text{ kg} = 575 \text{ kg}$$

Hence, 575 kg of ore is required to get 69 kg of copper.

Q7

**Answer :**

Let x be the maximum marks.

Pass marks =  $(123 + 39) = 162$

Then, 36% of x = 162

$$\Rightarrow \left(\frac{36}{100} \times x\right) = 162$$

$$\Rightarrow x = \left(\frac{162 \times 100}{36}\right) = 450$$

$\therefore$  Maximum marks = 450

Q8

**Answer :**

Suppose that the fruit seller initially had 100 apples.

Apples sold = 40

$\therefore$  Remaining apples =  $(100 - 40) = 60$

Initial amount of apples if 60 of them are remaining = 100

Initial amount of apples if 1 of them is remaining =  $\left(\frac{100}{60}\right)$

Initial amount of apples if 420 of them are remaining =  $\left(\frac{100}{60} \times 420\right) = 700$

Hence, the fruit seller originally had 700 apples.

Q9

**Answer :**

Suppose that 100 candidates took the examination.

Number of passed candidates = 72

Number of failed candidates =  $(100 - 72) = 28$

Total number of candidates if 28 of them failed = 100

Total number of candidates if 392 of them failed =  $\left(\frac{100}{28} \times 392\right) = 1400$

Hence, the total number of examinees is 1400.

Q10

**Answer :**

Suppose that the gross value of the moped is Rs  $x$ .

Commission on the moped = 5%

Price of moped after deducting the commission = Rs ( $x - 5\%$  of  $x$ )

$$= \text{Rs} \left( x - \frac{5x}{100} \right) = \text{Rs} \left( \frac{100x - 5x}{100} \right) = \text{Rs} \left( \frac{95x}{100} \right)$$

Now, price of the moped after deducting the commission = Rs 15200

$$\text{Then, Rs} \left( \frac{95x}{100} \right) = \text{Rs } 15200$$

$$\therefore x = \text{Rs} \left( \frac{15200 \times 100}{95} \right) = \text{Rs} (160 \times 100) = \text{Rs } 16000$$

Hence, the gross value of the moped is Rs 16000.

Q11

**Answer :**

Total quantity of gunpowder = 8 kg = 8000 g (1 kg = 1000 g)

Quantity of nitre in it = 75% of 8000 g

$$= \left( \frac{75}{100} \times 8000 \right) \text{ g} = 6000 \text{ g} = 6 \text{ kg}$$

Quantity of sulphur in it = 10% of 8000 g

$$= \left( \frac{10}{100} \times 8000 \right) \text{ g} = 800 \text{ g} = 0.8 \text{ kg}$$

$\therefore$  Quantity of charcoal in it = {8000 - (6000 + 800)} g

$$= (8000 - 6800) \text{ g}$$

$$= 1200 \text{ g} = 1.2 \text{ kg}$$

Hence, the amount of charcoal in 8 kg of gunpowder is 1.2 kg.

Q12

**Answer :**

Total quantity of chalk = 1 kg = 1000 g

Now, we have the following:

Quantity of carbon in it = 3% of 1000 g

$$= \left( \frac{3}{100} \times 1000 \right) = 30 \text{ g}$$

Quantity of calcium in it = 10% of 1000 g

$$= \left( \frac{10}{100} \times 1000 \right) \text{ g} = 100 \text{ g}$$

Quantity of oxygen in it = 12% of 1000 g

$$= \left( \frac{12}{100} \times 1000 \right) \text{ g} = 120 \text{ g}$$

Q13

**Answer :**

Let  $x$  be the total number of days on which the school was open.

Number of days when Sonal went to school = 219

Percentage of attendance = 75

Thus, 75% of  $x = 219$

$$\Rightarrow \left( \frac{75}{100} \times x \right) = 219$$

$$\therefore x = \left( \frac{219 \times 100}{75} \right) = 292 \text{ days}$$

Hence, the school was open for a total of 292 days.

Q14

**Answer :**

Let the total value of the property be Rs  $x$ .

Percentage of commission = 3

Amount of commission = Rs 42660

Thus, 3% of Rs  $x =$  Rs 42660

$$\Rightarrow \left( \frac{3}{100} \times x \right) = 42660$$

$$\therefore x = \left( \frac{42660 \times 100}{3} \right) = 1422000$$

Hence, the total value of the property is Rs 14,22,000.

Q15

**Answer :**

Total number of eligible voters = 60000

$$\begin{aligned}\text{Number of voters who gave their votes} &= 80\% \text{ of } 60000 \\ &= \left(\frac{80}{100} \times 60000\right) = 48000\end{aligned}$$

$$\begin{aligned}\text{Number of votes in favour of candidate A} &= 60\% \text{ of } 48000 \\ &= \left(\frac{60}{100} \times 48000\right) = 28800\end{aligned}$$

$$\therefore \text{Number of votes received by candidate B} = (48000 - 28800) = 19200$$

Hence, candidate B received 19,200 votes.

Q16

**Answer :**

Let us assume that the original price of the shirt is Rs  $x$ .

Discount on the shirt = 12%

$$\begin{aligned}\text{So, value of discount on the shirt} &= 12\% \text{ of Rs } x \\ &= \text{Rs} \left(\frac{12}{100} \times x\right) = \text{Rs} \left(\frac{12x}{100}\right)\end{aligned}$$

$$\begin{aligned}\text{Value of the shirt after discount} &= \text{Rs} \left(x - \frac{12x}{100}\right) \\ &= \text{Rs} \left(\frac{100x - 12x}{100}\right) = \text{Rs} \left(\frac{88x}{100}\right)\end{aligned}$$

Present price of the shirt = Rs 1188

$$\text{Then, Rs} \left(\frac{88x}{100}\right) = \text{Rs } 1188$$

$$\Rightarrow 88x = (1188 \times 100)$$

$$\Rightarrow 88x = 118800$$

$$\therefore x = \left(\frac{118800}{88}\right) = 1350$$

Hence, the original price of the shirt is Rs 1350.

Q17

**Answer :**

Let us assume that the original price of the sweater is Rs.  $x$

Increased percentage = 8%

$$\begin{aligned}\text{So, value of increase on the sweater} &= 8\% \text{ of Rs } x \\ &= \text{Rs} \left(\frac{8}{100} \times x\right) = \text{Rs} \left(\frac{2x}{25}\right)\end{aligned}$$

$$\begin{aligned}\text{Increased price of the sweater} &= \text{Rs} \left(x + \frac{2x}{25}\right) \\ &= \text{Rs} \left(\frac{25x + 2x}{25}\right) = \text{Rs} \left(\frac{27x}{25}\right)\end{aligned}$$

However, increased price of the sweater = Rs 1566

$$\text{Then, Rs} \left(\frac{27x}{25}\right) = \text{Rs } 1566$$

$$\therefore x = \left(\frac{1566 \times 25}{27}\right) = 1450$$

Hence, the original price of the sweater is Rs 1450

Q18

**Answer :**

Let the income of the man be Rs  $x$ .

Then, income spent = 80% of Rs.  $x$

$$= \text{Rs} \left(\frac{80}{100} \times x\right) = \text{Rs} \left(\frac{80x}{100}\right) = \text{Rs} \left(\frac{4x}{5}\right)$$

$$\text{Amount left after all the expenditure} = \text{Rs} \left(x - \frac{4x}{5}\right) = \text{Rs} \left(\frac{5x - 4x}{5}\right) = \text{Rs} \left(\frac{x}{5}\right)$$

Amount given to the charity = 10% of Rs  $\left(\frac{x}{5}\right)$

$$= \text{Rs} \left(\frac{10}{100} \times \frac{x}{5}\right) = \text{Rs} \left(\frac{10x}{500}\right) = \text{Rs} \left(\frac{x}{50}\right)$$

Amount left after the charity = Rs  $\left(\frac{x}{5} - \frac{x}{50}\right)$

$$= \text{Rs} \left(\frac{10x - x}{50}\right) = \text{Rs} \left(\frac{9x}{50}\right)$$

Now, we have:

$$\text{Rs} \left(\frac{9x}{50}\right) = \text{Rs } 46260$$

$$\therefore x = \text{Rs} \left(\frac{46260 \times 50}{9}\right) = \text{Rs } 257000$$

Hence, the income of the man is Rs 2,57,000.

Q19

**Answer :**

Let the number be 100.

Increase in the number = 20%

Increased number =  $(100 + 20) = 120$

Now, decrease in the number = (20% of 120)

$$= \left( \frac{20}{100} \times 120 \right) = 24$$

New number =  $(120 - 24) = 96$

Net decrease =  $(100 - 96) = 4$

Net decrease percentage =  $\left( \frac{4}{100} \times 100 \right) = 4$

Hence, the net decrease is 4%.

Q20

**Answer :**

Let the original salary be Rs 100.

Increase in it = 20%

Salary after increment = Rs  $(100 + 20) =$  Rs 120

To restore the original salary, reduction required = Rs  $(120 - 100) =$  Rs 20

Reduction on Rs 120 = Rs 20

$\therefore$  Reduction percentage =  $\left( \frac{20}{120} \times 100 \right) = \left( \frac{100}{6} \right) = 16\frac{2}{3}$

Hence, the required reduction on the new salary is  $16\frac{2}{3}\%$ .

Q21

**Answer :**

Total cost of the property = Rs 540000

Commission on the first Rs 200000 = 2% of Rs 200000

$$= \left( \frac{2}{100} \times 200000 \right) = \text{Rs } 4000$$

Commission on the next Rs 200000 = 1% of Rs 200000

$$= \left( \frac{1}{100} \times 200000 \right) = \text{Rs } 2000$$

Remaining amount = Rs  $(540000 - 400000) =$  Rs 140000

$\therefore$  Commission on Rs 140000 = 0.5% of Rs 140000

$$= \text{Rs } \left( \frac{0.5}{100} \times 140000 \right)$$

$$= \text{Rs } \left( \frac{5}{1000} \times 140000 \right) = \text{Rs } 700$$

Thus, total commission on the property worth Rs 540000 = Rs  $(4000 + 2000 + 700)$

= Rs 6700

Hence, the commission of the property dealer on the property that has been sold for Rs 540000 is Rs 6700.

Q22

**Answer :**

Let Akhil's income be Rs 100.

$\therefore$  Nikhil's income = Rs 80

Akhil's income when Nikhil's income is Rs 80 = Rs 100

Akhil's income when Nikhil's income is Rs 100 = Rs  $\left( \frac{100}{80} \times 100 \right) =$  Rs 125

i.e., if Nikhil's income is Rs. 100, then Akhil's income is Rs 125.

Hence, Akhil's income is more than that of Nikhil's by 25%.

Q23

**Answer :**

Let Rs 100 be the income of Mr. Thomas.

$\therefore$  John's income = Rs 120

Mr. Thomas' income when John's income is Rs 120 = Rs 100

Mr. Thomas' income when John's income is Rs 100 = Rs  $\left( \frac{100}{120} \times 100 \right) =$  Rs  $83\frac{1}{3}$

Hence, Mr Thomas' income is less than that of John's by  $16\frac{2}{3}\%$ .

Q21

**Answer :**

Let Rs  $x$  be the value of the machine one year ago.

Then, its present value = 90% of Rs  $x$

$$= \text{Rs} \left( \frac{90}{100} \times x \right) = \text{Rs} \left( \frac{9x}{10} \right)$$

It is given that present value of the machine = Rs 387000

$$\Rightarrow x = \text{Rs} \left( \frac{387000 \times 10}{9} \right) = \text{Rs} (43000 \times 10) = \text{Rs} 430000$$

Hence, the value of the machine a year ago was Rs 430000.

Q25

**Answer :**

The present value of the car = Rs 450000

The decrease in its value after the first year = 20% of Rs 450000

$$= \text{Rs} \left( \frac{20}{100} \times 450000 \right) = \text{Rs} 90000$$

The depreciated value of the car after the first year = Rs (450000 – 90000) = Rs 360000

The decrease in its value after the second year = 20% of Rs 360000

$$= \text{Rs} \left( \frac{20}{100} \times 360000 \right) = \text{Rs} 72000$$

The depreciated value of the car after the second year = Rs (360000 – 72000) = Rs 288000

Hence, the value of the car after two years will be Rs 288000.

Q26

**Answer :**

Present population of the town = 60000

Increase in population of the town after the 1 year = 10% of 60000

$$= \left( \frac{10}{100} \times 60000 \right) = 6000$$

Thus, population of the town after 1 year = 60000 + 6000 = 66000

Increase in population after 2 years = 10% of 66000

$$= \left( \frac{10}{100} \times 66000 \right) = 6600$$

Thus, population after the second year = 66000 + 6600 = 72600

Hence, the population of the town after 2 years will be 72600.

Q27

**Answer :**

Let the consumption of sugar originally be 1 unit and let its cost be Rs 100

New cost of 1 unit of sugar = Rs 125

Now, Rs 125 yield 1 unit of sugar.

$$\therefore \text{Rs } 100 \text{ will yield } \left( \frac{1}{125} \times 100 \right) \text{ unit} = \left( \frac{4}{5} \right) \text{ unit of sugar.}$$

$$\text{Reduction in consumption} = \left( 1 - \frac{4}{5} \right) = \left( \frac{1}{5} \right) \text{ unit}$$

$$\therefore \text{Reduction percent in consumption} = \left( \frac{1}{5} \times \frac{1}{1} \times 100 \right) \% = \left( \frac{100}{5} \right) \% = 20\%$$

# Percentage

## Exercise 10C

Q1

**Answer :**

(b) 75%

$$\frac{3}{4} = \left( \frac{3}{4} \times 100 \right) \% = 75\%$$

Q2

**Answer :**

(c) 40%

$$2 : 5 = \frac{2}{5} = \left( \frac{2}{5} \times 100 \right) \% = 40\%$$

Q3

**Answer :**

(c)  $\frac{1}{12}$

$$8\frac{1}{3}\% = \frac{25}{3}\% = \left( \frac{25}{3} \times \frac{1}{100} \right) = \left( \frac{1}{3 \times 4} \right) = \frac{1}{12}$$

Q4

**Answer :**

(c) 12

We have  $x\%$  of 75 = 9

$$\Rightarrow \left( \frac{x}{100} \times 75 \right) = 9$$

$$\therefore x = \left( \frac{9 \times 100}{75} \right) = 12$$

Hence, the value of  $x$  is 12

Q5

**Answer :**

(d) 10%

Let  $x$  be the required percent.

Then,  $x\%$  of  $\frac{2}{7} = \frac{1}{35}$

$$\Rightarrow \left( \frac{x}{100} \times \frac{2}{7} \right) = \frac{1}{35}$$

$$\therefore x = \left( \frac{100 \times 7}{35 \times 2} \right) = 10$$

Hence, 10% of  $\frac{2}{7}$  is  $\frac{1}{35}$

Q6

**Answer :**

(b) 2.5%

Let  $x\%$  of 1 day be 36 min.

Then,  $\left( \frac{x}{100} \times 1 \times 24 \times 60 \right) \text{ min} = 36 \text{ min}$

$$\therefore x = \left( \frac{36 \times 100}{24 \times 60} \right) = \left( \frac{3 \times 5}{2 \times 3} \right) \% = \left( \frac{5}{2} \right) \% = 2.5\%$$

Hence, 2.5% of 1 day is 36 min.

Q7

**Answer :**

(a) 35

Let the required number be  $x$ .

Then,  $x + 20\%$  of  $x = 42$

$$\Rightarrow \left( x + \frac{20x}{100} \right) = 42$$

$$\Rightarrow \left( x + \frac{x}{5} \right) = 42$$

$$\Rightarrow \left( \frac{5x + x}{5} \right) = 42 \quad [\because \text{LCM of 1 and 5} = 5]$$

$$\Rightarrow \left( \frac{6x}{5} \right) = 42$$

$$\therefore x = \left( \frac{42 \times 5}{6} \right) = 35$$

Hence, the required number is 35.

Q8

**Answer :**

(b) 75

Let the required number be  $x$ .

Then,  $x - 8\%$  of  $x = 69$

$$\Rightarrow \left( x - \frac{8x}{100} \right) = 69$$

$$\Rightarrow \left( x - \frac{2x}{25} \right) = 69$$

$$\Rightarrow \left( \frac{25x - 2x}{25} \right) = 69 \quad [\text{Since L.C.M. of 1 and 25} = 25]$$

$$\Rightarrow \left( \frac{23x}{25} \right) = 69$$

$$\therefore x = \left( \frac{69 \times 25}{23} \right) = 75$$

Hence, the required number is 75

Q9

**Answer :**

(d) 8 kg

Let  $x$  kg be the required amount of ore.

Then, 5% of  $x$  kg = 400 g = 0.4 kg  $[\because 1 \text{ kg} = 1000 \text{ g}]$

$$\Rightarrow \left( \frac{5}{100} \times x \right) = 0.4$$

$$\Rightarrow x = \left( \frac{0.4 \times 100}{5} \right) = 8$$

Hence, 8 kg of ore is required to obtain 400 g of copper.

Q10

**Answer :**

(b) Rs. 20000

Suppose that the gross value of the TV is Rs  $x$ .

Commission on the TV = 10%

Price of the TV after deducting the commission = Rs  $(x - 10\% \text{ of } x)$

$$= \text{Rs} \left( x - \frac{10}{100} x \right) = \text{Rs} \left( \frac{100x - 10x}{100} \right) = \text{Rs} \left( \frac{9x}{10} \right)$$

However, price of the TV after deducting the commission = Rs 18000

Then, Rs  $\left( \frac{9x}{10} \right) = \text{Rs } 18000$

$$\therefore x = \left( \frac{18000 \times 10}{9} \right) = \text{Rs} (2000 \times 10) = \text{Rs } 20000$$

Hence, the gross value of the TV is Rs 20,000

Q11

**Answer :**

(b) Rs. 16000

Let us assume that the original salary of the man is Rs  $x$ .

Increase in it = 25%

Value increased in the salary = 25% of Rs.  $x$

$$= \text{Rs} \left( \frac{25}{100} \times x \right) = \text{Rs} \left( \frac{x}{4} \right)$$

Salary after increment = Rs  $\left( x + \frac{x}{4} \right) = \text{Rs} \left( \frac{5x}{4} \right)$

However, increased salary = Rs 20000

Then, Rs  $\left( \frac{5x}{4} \right) = \text{Rs } 20000$

$$\therefore x = \text{Rs} \left( \frac{20000 \times 4}{5} \right) = \text{Rs } 16000$$

Hence, the original salary of the man is Rs 16,000

Q12

**Answer :**

(c) 560

Suppose that the number of examinees is 100.

Number of passed examinees = 95

Number of failed examinees =  $(100 - 95) = 5$

Total number of examinees if 5 of them failed = 100

$$\text{Total number of examinees if 28 of them failed} = \left( \frac{100}{5} \times 28 \right) = (20 \times 28) = 560$$

Hence, there were 560 examinees.

Q13

**Answer :**

(c) 700

Suppose that the fruit seller initially had 100 apples.

Number of apples sold = 40

$\therefore$  Number of remaining apples =  $(100 - 40) = 60$

Initial number of apples if 60 of them are remaining = 100

$$\text{Initial number of apples if 420 of them are remaining} = \left( \frac{100}{60} \times 420 \right) = 700$$

Hence, the fruit seller originally had 700 apples with him.

Q14

**Answer :**

(c) Rs. 25250

Present value of the machine = Rs 25000

Decrease in its value after 1 year = 10% of Rs 25000

$$= \text{Rs} \left( \frac{10}{100} \times 25000 \right) = \text{Rs } 2500$$

Depreciated value after 1 year = Rs  $(25000 - 2500) = \text{Rs } 22500$

Hence, the value of the machine after 1 year will be Rs 22500

Q15



**Answer :**

(c) 75

Let the required number be  $x$ . Then, we have:

$$8\% \text{ of } x = 6$$

$$\Rightarrow \left( \frac{8}{100} \times x \right) = 6$$

$$\therefore x = \left( \frac{6 \times 100}{8} \right) = 75$$

Hence, the required number is 75

Q16

**Answer :**

(c) 270

$$\begin{aligned} 60\% \text{ of } 450 &= \left( \frac{60}{100} \times 450 \right) \\ &= \left( \frac{3}{5} \times 450 \right) = (3 \times 90) = 270 \end{aligned}$$

Q17

**Answer :**

(d) Rs. 700

Let us assume that the original price of the chair is Rs  $x$ .

Reduce percentage on the chair = 6%

So, value of reduction on the chair = 6% of Rs.  $x$

$$= \text{Rs} \left( \frac{6}{100} \times x \right) = \text{Rs} \left( \frac{3x}{50} \right)$$

$$\begin{aligned} \text{Reduced price of the chair} &= \text{Rs} \left( x - \frac{3x}{50} \right) \\ &= \text{Rs} \left( \frac{50x - 3x}{50} \right) = \text{Rs} \left( \frac{47x}{50} \right) \end{aligned}$$

However, present price of the chair = Rs 658

$$\text{Then, Rs} \left( \frac{47x}{50} \right) = \text{Rs } 658$$

$$\Rightarrow \text{Rs} \left( \frac{47x}{50} \right) = \text{Rs } 658$$

$$\Rightarrow x = \text{Rs} \left( \frac{658 \times 50}{47} \right) = \text{Rs} (14 \times 50) = 700$$

Hence, the original price of the chair is Rs 700

Q18

**Answer :**

(b) 560

Let the total number of students be 100.

Then, number of boys = 70

$$\therefore \text{Number of girls} = (100 - 70) = 30$$

Now, total number of students if there are 30 girls = 100

$$\text{Total number of students if there are 240 girls} = \left( \frac{100}{30} \times 240 \right) = 800$$

$$\therefore \text{Number of boys} = (800 - 240) = 560$$

Hence, there are 560 boys in the school.

Q19

**Answer :**

(c) 450

Let  $x$  be the number.

$$(11\% \text{ of } x) - (7\% \text{ of } x) = 18$$

$$\Rightarrow \left( \frac{11x}{100} - \frac{7x}{100} \right) = 18$$

$$\Rightarrow \frac{4x}{100} = 18$$

$$\therefore x = \left( \frac{18 \times 100}{4} \right) = (18 \times 25) = 450$$

Hence, the required number is 450

Q20

**Answer :**

(a) 60

Let  $x$  be the number.

According to question, we have:

$$(35\% \text{ of } x) + 39 = x$$

$$\Rightarrow \left( \frac{35}{100} \times x \right) + 39 = x$$

$$\Rightarrow \left( \frac{7x}{20} \right) + 39 = x$$

$$\Rightarrow \left( x - \frac{7x}{20} \right) = 39$$

$$\Rightarrow \left( \frac{20x - 7x}{20} \right) = 39$$

$$\Rightarrow \left( \frac{13x}{20} \right) = 39$$

$$\therefore x = \left( \frac{39 \times 20}{13} \right) = 60$$

Hence, the required number is 60

Q21

**Answer :**

(c) 500

Let  $x$  be the maximum marks.

$$\text{Pass marks} = (145 + 35) = 180$$

$$\therefore 36\% \text{ of } x = 180$$

$$\Rightarrow \left( \frac{36}{100} \times x \right) = 180$$

$$\Rightarrow x = \left( \frac{180 \times 100}{36} \right) = (5 \times 100) = 500$$

Hence, maximum marks = 500

Q22

**Answer :**

(d) 225

Let  $x$  be the number.

According to question, we have:

$$x - 40\% \text{ of } x = 135$$

$$\Rightarrow \left( x - \frac{40x}{100} \right) = 135$$

$$\Rightarrow \left( \frac{100x - 40x}{100} \right) = 135$$

$$\Rightarrow \left( \frac{60x}{100} \right) = 135$$

$$\Rightarrow x = \left( \frac{135 \times 100}{60} \right) = 225$$

Hence, the required number is 225