Question:1

Convert each of the following fraction into a percentage:

$i\ \frac{47}{100}$
$ii\ \frac{9}{20}$
$iii\ \frac{3}{8}$
$iv\ \frac{8}{125}$
$v\ \frac{19}{500}$
$vi\ \frac{4}{15}$
$vii\ \frac{2}{3}$
$viii\ 1\frac{3}{5}$

Solution:

We have the following:

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

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

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

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

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

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

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

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

Question:2

Convert each of the following into a fraction:

i 32%
$ii\ 6\frac{1}{4}\%$
$iii\ 26\frac{2}{3}\%$

iv 120%
v 6.25%
vi 0.8%
vii 0.06%
$viii$ 22.75%

Solution:

We have the following:

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

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

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

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

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

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

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

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

Question:3

Express each of the following as a ratio:

i 43%
ii 36%
iii 7.5%
iv 125%

Solution:

We have:

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

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

$iii\ 7.5\% = \left(\frac{7.5}{100}\right) = \left(\frac{75}{10\times100}\right) = \frac{3}{40} = 3\ :\ 40$

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

Question:4

Convert each of the following ratios into a percentage:

i 37 : 100
ii 16 : 25
iii 3 : 5
iv 5 : 4

Solution:

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

Question:5

Convert each of the following into decimal form:

i 45%
ii 127%
iii 3.6%
iv 0.23%

Solution:

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% =$\left(\frac{3.6}{100}\right) = \left(\frac{36}{10\times100}\right) = \frac{36}{1000} = 0.036$

iv 0.23% =$\left(\frac{0.23}{100}\right) = \left(\frac{23}{100\times100}\right) = \frac{23}{10000} = 0.0023$

Question:6

Convert each of the following decimals into a percentage:

i 0.6
ii 0.42
iii 0.07
iv 0.005

Solution:

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%

Question:7

Find:

i 32% of 425
ii $16\frac{2}{3}\%$ of 16
iii 6.5% of 400
iv 136% of 70
v 2.8% of 35
vi 0.6% of 45

Solution:

We have:
i 32% of 425 = $\left(\frac{32}{100} \times 425\right) = \left(\frac{32\times17}{4}\right) = (8 \times 17) = 136$

ii $16\frac{2}{3}\%$ of 16 = $\frac{50}{3}\%$ of 16 = $\left(\frac{50}{3\times100} \times 16\right) = \left(\frac{1}{6} \times 16\right) = \frac{8}{3} = 2\frac{2}{3}$

iii 6.5% of 400 = $\left(\frac{6.5}{100} \times 400\right) = \left(\frac{65}{10\times100} \times 400\right) = \left(\frac{65\times4}{10}\right) = \frac{260}{10} = 26$

iv 136% of 70 = $\left(\frac{136}{100} \times 70\right) = \left(\frac{136\times7}{10}\right) = \left(\frac{952}{10}\right) = 95.2$

v 2.8% 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% of 45 = $\left(\frac{0.6}{100} \times 45\right) = \left(\frac{6}{10 \times 100} \times 45\right) = \left(\frac{3 \times 45}{5 \times 100}\right) = \left(\frac{3 \times 9}{100}\right) = \frac{27}{100} = 0.27$

Question:8

Find:

i 25% of Rs 76
ii 20% of Rs 132
iii 7.5% of 600 m
iv $3\frac{1}{3}\%$ of 90 km
v 8.5% of 5 kg
vi 20% of 12 litres

Solution:

We have the following:

i 25% of Rs 76 = Rs $\left(76 \times \frac{25}{100}\right)$ = Rs $\left(76 \times \frac{1}{4}\right)$ = Rs 19

ii 20% of Rs 132 = Rs $\left(132 \times \frac{20}{100}\right)$= Rs $\left(132 \times \frac{1}{5}\right)$ = Rs 26.4

iii 7.5% of 600 m = $\left(600 \times \frac{7.5}{100}\right)$ m $= (6 \times 7.5)$ m $= 45$ m

iv $3\frac{1}{3}\%$ of 90 km = $\frac{10}{3}\%$of 90 km =$\left(90 \times \frac{10}{3 \times 100}\right)$ km $= \left(90 \times \frac{1}{30}\right)$ km $= 3$ km

v 8.5% of 5 kg = $\left(5 \times \frac{8.5}{100}\right)$ kg $= \left(5 \times \frac{85}{1000}\right)$ kg $= 0.425$ kg $= 425$ g

$\because 1kg = 1000g$

vi 20% of 12 L = $\left(12 \times \frac{20}{100}\right)$ L $= \left(12 \times \frac{1}{5}\right)$ L $= 2.4$ L

Question:9

Find the number whose 13% is 65.

Solution:

Let x be the required number.

Then, 13% 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.

Question:10

Find the number whose $6\frac{1}{4}\%$ is 2.

Solution:

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.

Question:11

What amount is 10% more than Rs 90?

Solution:

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

$\therefore$ Amount that is 10% more than Rs 90 = Rs $90 + 9$ = Rs 99

Hence, the required amount is Rs 99.

Question:12

What amount is 20% less than Rs 60?

Solution:

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

$\therefore$ Amount that is 20% less than Rs 60 = Rs $60 - 12$ = Rs 48

Hence, the required amount is Rs 48.

Question:13

If 3% of x is 9, find the value of x.

Solution:

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.

Question:14

If 12.5% of x is 6, find the value of x.

Solution:

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.

Question:15

What per cent of 84 is 14?

Solution:

Let x% of 84 be 14.

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.

Question:16

What percentage is

i Rs 15 of Rs 120?

ii 36 minutes of 2 hours?

iii 8 hours of 2 days

iv 160 metres of 4 km?

v 175 mL of 1 litre?

vi 25 paise of Rs 4?

Solution:

i Let x% of Rs 120 be Rs 15.

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

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

$\therefore x = \left(\frac{15\times5}{6}\right)\% = \left(\frac{25}{2}\right)\% = 12.5\%$

Hence, 12.5% of Rs 120 is Rs 15.

ii Let *x*% of 2 h be 36 min.

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

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

$\therefore x = \left(\frac{36\times100}{120}\right)\% = 30\%$

Hence, 30% of 2 h is 36 min.

iii Let *x*% of 2 days be 8 h.

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

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

$\therefore x = \left(\frac{8\times100}{48}\right)\% = 16\frac{2}{3}\%$

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

iv Let *x*% of 4 km be 160 m.

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

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

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

Question:17

Rupesh secures 495 marks out of 750 in his annual examination. Find the percentage of marks obtained by him.

Solution:

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.

Question:18

The monthly salary of a typist is Rs 15625. If he gets an increase of 12%, find his new salary.

Solution:

Total monthly salary = Rs 15625

Increase percentage = 12%

∴ Amount increase = 12% of Rs 15625

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

∴ New salary = Rs 15625 + Rs 1875

= Rs 17500

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

Question:19

The excise duty on a certain item has been reduced to Rs 760 from Rs 950. Find the reduction per cent in the excise duy on that item.

Solution:

Original excise duty on the item = Rs 950

Amount reduced on excise duty = Rs $950 - 760$ = Rs 190

∴ Reduction percent = $\left(\frac{\text{Reduction amount}}{\text{Original value}} \times 100\right)$

= $\left(\frac{190}{950} \times 100\right)$ = 20

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

Question:20

96% of the cost of a TV is Rs 10464. What is its total cost?

Solution:

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

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

⇒ 96% of Rs *x* = Rs 10464

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

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

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

Question:21

70% of the students in a school are boys and the number of girls is 504. Find the number of boys in the school.

Solution:

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.

Question:22

An ore contains 12% copper. How many kilograms of the ore are required to get 69 kg of copper?

Solution:

Let x kg be the amount of the required ore.

Then, 12% of x kg = 69 kg

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

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

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

Question:23

36% of the maximum marks are required to pass a test. A student gets 123 marks and is declared failed by 39 marks. Find the maximum marks.

Solution:

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

Question:24

A fruit-seller had some apples. He sells 40% of them and still has 420 apples. Find the number of apples he had originally.

Solution:

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.

Question:25

In an examination, 72% of the total examinees passed. If the number of failures is 392, find the total number of examinees.

Solution:

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.

Question:26

After decuting a commission of 5%, a moped costs Rs 15200. What is its gross value?

Solution:

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

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

$\therefore x$ = Rs $\left(\frac{15200\times100}{95}\right)$ = Rs (160 $\times$ 100) = Rs 16000

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

Question:27

Gunpowder contains 75% of nitre and 10% of sulphur, and the rest of it is charcoal. Find the amount of charcoal in 8 kg of gunpowder.

Solution:

Total quantity of gunpowder = 8 kg = 8000 g $\qquad 1kg = 1000g$

Quantity of nitre in it = 75% of 8000 g

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

Quantity of sulphur in it = 10% of 8000 g

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

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

= $8000 - 6800$g

= 1200 g = 1.2 kg

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

Question:28

Chalk contains 3% of carbon, 10% of calcium and 12% of oxygen. Find the amount in grams of each of these substances in 1 kg of chalk.

Solution:

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 g

Quantity of calcium in it = 10% of 1000 g

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

Quantity of oxygen in it = 12% of 1000 g

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

Question:29

Sonal went to school for 219 days in a full year. If her attendance is 75%, find the number of days on which the school was open.

Solution:

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

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

∴ *x* = days

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

Question:30

3% commission on the sale of a property amounts to Rs 42660. What is the total value of the property?

Solution:

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

⇒ = 42660

∴ *x* =

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

Question:31

In an election, there were two candidates A and B. The total number of voters in this constituency was 60000 and 80% of the total votes were polied. If 60% of the polied votes were cast in favour of A, how many votes were received by B?

Solution:

Total number of eligible voters = 60000

Number of voters who gave their votes = 80% of 60000

= = 48000

Number of votes in favour of candidate A = 60% of 48000

= = 28800

∴ Number of votes received by candidate B = 48000 – 28800 = 19200

Hence, candidate B recieved 19,200 votes.

Question:32

The price of a shirt is reduced by 12% in a discount sale. If its present price is Rs 1188, find its original price.

Solution:

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

Discount on the shirt = 12%

So, value of discount on the shirt = 12% of Rs *x*

= Rs = Rs

Value of the shirt after discount = Rs

= Rs = Rs

Present price of the shirt = Rs 1188

Then, Rs = Rs 1188

⇒ 88*x* = (1188 100)

⇒ 88*x* = 118800

∴ *x* = = 1350

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

Question:33

The price of a sweater is increased by 8%. If its increased price is Rs 1566, find the original price.

Solution:

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

Increased percentage = 8%

So, value of increase on the sweater = 8% of Rs *x*

= Rs = Rs

Increased price of the sweater = Rs

= Rs = Rs

However, increased price of the sweater = Rs 1566

Then, Rs = Rs 1566

∴ *x* = = 1450

Hence, the original price of the sweater is Rs 1450

Question:34

After spending 80% of his income and giving 10% of the remainder in a charity, a man has Rs 46260 left with him. Find his income.

Solution:

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

Then, income spent = 80% of Rs. x

= Rs = Rs = Rs

Amount left after all the expenditure = Rs = Rs = Rs

Amount given to the charity = 10% of Rs

= Rs = Rs = Rs

Amount left after the charity = Rs

= Rs = Rs

Now, we have:

Rs = Rs 46260

$\therefore$ x = Rs = Rs 257000

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

Question:35

A number is increased by 20% and the increased number is decreased by 20%. Find the net increase of decrease per cent.

Solution:

Let the number be 100.

Increase in the number = 20%

Increased number = 100 + 20 =120

Now, decrease in the number = 20% of 120

=

New number = 120 – 24 = 96

Net decrease = 100 – 96 = 4

Net decrease percentage = = 4

Hence, the net decrease is 4%.

Question:36

The salary of an officer is increased by 20%. By what percentage should the new salary be reduced to restore the original salary?

Solution:

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 = = =

Hence, the required reduction on the new salary is .

Question:37

A property dealer charges commission at the rate of 2% on the first Rs 200000, 1% on the next Rs 200000 and 0.5% on the remaining price. Find his commission on the property that has been sold for Rs 540000.

Solution:

Total cost of the property = Rs 540000

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

= = Rs 4000

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

= = Rs 2000

Remaining amount = Rs 540000 – 400000 = Rs 140000

∴ Commission on Rs 140000 = 0.5% of Rs 140000

= Rs

= Rs = 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.

Question:38

Nikhil's income is 20% less than that of Akhil. How much per cent is Akhil's income more than that of Nikhil's?

Solution:

Let Akhil's income be Rs 100.

∴ 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 = 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%.

Question:39

Jhon's income is 20% more than that of Mr Thomas. How much per cent is the income of Mr Thomas less than that of John?

Solution:

Let Rs 100 be the income of Mr. Thomas.

∴ 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 = Rs
Hence, Mr Thomas' income is less than that of John's by .

Question:40

The value of a machine depreciated 10% every year. If its present value is Rs 387000, what was its value 1 year ago?

Solution:

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

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

= Rs = Rs

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

⇒ *x* = Rs = Rs = Rs 430000

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

Question:41

The value of a car decreases annually by 20%. If the present value of the car be Rs 450000, what will be its value after 2 years?

Solution:

The present value of the car = Rs 450000

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

= Rs = 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

= Rs = 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.

Question:42

The population of a town increases 10% annually. If its present population is 60000, what will be its population after 2 years?

Solution:

Present population of the town = 60000

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

= = 6000

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

Increase in population after 2 years = 10% of 66000

= = 6600

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

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

Question:43

Due to an increase in the price of sugar by 25%, by how much per cent must a householder decrease the consumption of sugar so that there is no increase in the expenditure on sugar?

Solution:

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.

∴ Rs 100 will yield unit = unit of sugar.

Reduction in consumption = = unit

∴ Reduction percent in consumption = %= %= 20%

Question:44

Mark ✓ against the correct answer

as rate per cent is

a 7.5%

b 75%

c 0.75%

d none of these

Solution:

b 75%

= = 75%

Question:45

Mark ✓ against the correct answer

The ratio 2 : 5 as rate per cent is

a 4%

b 0.4%

c 40%

d 14%

Solution:

c 40%

2 : 5 = = = 40%

Question:46

Mark ✓ against the correct answer

expressed as a fraction, is

a

b

c

d

Solution:

c

= =

Question:47

Mark ✓ against the correct answer

If *x*% of 75 = 9, then the value of *x* is

a 16

b 14

c 12

d 8

Solution:

c 12

We have *x*% of 75 = 9

⇒

∴ *x* =

Hence, the value of *x* is 12

Question:48

Mark ✓ against the correct answer

What per cent of is ?

a 25%
b 20%
c 15%
d 10%
Solution:
d 10%

Let x be the required percent.
Then, x % of =
⇒
∴ x = = 10
Hence, 10% of is

Question:49
Mark ✓ against the correct answer
What per cent of 1 day is 36 minutes?

a 25%
b 2.5%
c 3.6%
d 0.25%
Solution:
b 2.5%

Let x % of 1 day be 36 min.
Then, min = 36 min
∴ x = =

Hence, 2.5% of 1 day is 36 min.

Question:50
Mark ✓ against the correct answer
A number increased by 20% gives 42. The number is

a 35
b 28

c 36

d 30

Solution:

a 35

Let the required number be x.

Then, x + 20% of x = 42

⇒

⇒

⇒ ∵ LCM of 1 and 5 = 5

⇒

∴ x =

Hence, the required number is 35.

Question:51

Mark ✓ against the correct answer

A number decreased by 8% gives 69. The number is

a 80

b 75

c 85

d none of these

Solution:

b 75

Let the required number be x.

Then, x – 8% of x = 69

⇒ = 69

⇒ = 69

⇒ = 69 Since L.C.M. of 1 and 25 = 25

⇒

∴ x = = 75

Hence, the required number is 75

Question:52

Mark ✓ against the correct answer

An ore contains 5% copper. How much ore is required to obtain 400 g of copper?

a 2 kg

b 4 kg

c 6 kg

d 8 kg

Solution:

d 8 kg

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

Then, 5% of *x* kg = 400 g = 0.4 kg ∵ 1 kg = 1000 g

⇒

⇒ *x* = = 8

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

Question:53

Mark ✓ against the correct answer

After deducting a commission of 10% a TV costs Rs 18000. What is its gross value?

a Rs 18800

b Rs 20000

c Rs 19800

d none of these

Solution:

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% of *x*)

= Rs = Rs = Rs

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

Then, Rs = Rs 18000

∴ *x* = = Rs (2000 10) = Rs 20000

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

Question:54

Mark ✓ against the correct answer

On increasing the salary of a man by 25%, it becomes Rs 20000. What was his original salary?

a Rs 15000

b Rs 16000

c Rs 18000

d Rs 25000

Solution:

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*

= Rs = Rs

Salary after increment= Rs = Rs

However, increased salary = Rs 20000

Then, Rs = Rs 20000

∴ *x* = Rs = Rs 16000

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

Question:55

Mark ✓ against the correct answer

In an examination, 95% of the total examinees passed. If the number of failures is 28, how many examinees were there?

a 600

b 480

c 560

d 840

Solution:

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

Total number of examinees if 28 of them failed =

Hence, there were 560 examinees.

Question:56

Mark ✓ against the correct answer

A fruit-seller had some apples. He sells 40% of them and still has 420 apples. How many apples had he in all?

a 588

b 600

c 700

d 725

Solution:

c 700

Suppose that the fruit seller initially had 100 apples.

Number of apples sold = 40

∴ Number of remaining apples = 100 – 40 = 60

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

Initial number of apples if 420 of them are remaining = = 700

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

Question:57

Mark ✓ against the correct answer

The value of a machine depreciated 10% annually. If its present value is Rs 25000, what will be its value after 1 year?

a Rs 27500

b Rs 22500

c Rs 25250

d none of these

Solution:

c Rs. 25250

Present value of the machine = Rs 25000

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

= Rs = Rs 2500

Depreciated value after 1 year = Rs 25000 – 2500 = Rs 22500

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

Question:58

Mark ✓ against the correct answer

8% of a number is 6. What is the number?

a 48

b 96

c 75

d 60

Solution:

c 75

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

8% of *x* = 6

⇒

∴ *x* =

Hence, the required number is 75

Question:59

Mark ✓ against the correct answer

60% of 450 = ?

a 180

b 210

c 270

d none of these

Solution:

c 270

60% of 450 =

= = (3 90) = 270

Question:60

Mark ✓ against the correct answer

On reducing the value of a chair by 6% it becomes Rs 658. The original value of the chair is

a Rs 750

b Rs 720

c Rs 500

d Rs 700

Solution:

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*

= Rs = Rs

Reduced price of the chair = Rs

= Rs = Rs

However, present price of the chair = Rs 658
Then, Rs = Rs 658
⇒ Rs = Rs 658
⇒ x = Rs = Rs
Hence, the original price of the chair is Rs 700

Question:61

Mark ✓ against the correct answer
70% of students in a school are boys. If the number of girls is 240, how many boys are there in the school?

a 420
b 560
c 630
d 480

Solution:
b 560

Let the total number of students be 100.
Then, number of boys = 70
∴ Number of girls = 100 – 70 = 30

Now, total number of students if there are 30 girls = 100
Total number of students if there are 240 girls =
∴ Number of boys = 800 – 240 = 560

Hence, there are 560 boys in the school.

Question:62
Mark ✓ against the correct answer
If 11% of a number exceeds 7% of the number by 18, the number is

a 72
b 360
c 450

d 720

Solution:

c 450

Let x be the number.

(11% of x) – (7% of x) = 18

⇒

⇒

∴ x =

Hence, the required number is 450

Question:63

Mark ✓ against the correct answer

If 35% of a number added to 39 is the number itself, the number is

a 60

b 65

c 75

d 105

Solution:

a 60

Let x be the number.

According to question, we have:

(35% of x) + 39 = x

⇒

⇒

⇒

⇒

⇒

∴ x = = 60

Hence, the required number is 60

Question:64

Mark ✓ against the correct answer

In an examination it is required to get 36% to pass. A student gets 145 marks and fails by 35 marks. The maximum marks are

a 400

b 450

c 500

d 600

Solution:

c 500

Let x be the maximum marks.

Pass marks = 145 + 35 = 180

∴ 36% of x = 180

⇒

⇒ x =

Hence, maximum marks = 500

Question:65

Mark ✓ against the correct answer

A number decreased by 40% gives 135. The number is

a 175

b 200

c 250

d 225

Solution:

d 225

Let x be the number.

According to question, we have:

x – 40% of x = 135

⇒

⇒

⇒

⇒ x = = 225

Hence, the required number is 225

Question:66

Convert:

i into a percentage

ii into a percentage

iii 45% into a percentage

iv 105% into a percentage

v 15% into a percentage

vi 12 : 25 into a percentage

Solution:

We have:

i =

ii =

iii 45% =

iv 105% =

v 15% == 3 : 20

vi 12 : 25 =

Question:67

i What per cent of 1 kg is 125 g?

ii What per cent of 80 m is 24 m?

Solution:

i Let x% of 1 kg be 125g.

Then,

$\Rightarrow 10x = 125$

$\Rightarrow x =$

Hence, of 1 kg is 125 g.

ii Let x% of 80 m be 24 m.

Then,

$\Rightarrow = 24$

$\Rightarrow x =$

Hence, of 80 m is 24 m.

Question:68

i Find of 30.

ii Find 15% of Rs 140

Solution:

i of 30 = of 30

=

= 5

ii 15% of Rs 140 = Rs

= Rs (3 7)

= Rs 21

Question:69

i Find the number whose is 5.

ii Find 0.8% of 45.

Solution:

i Let *x* be the required number.

Then, of *x* = 5

⇒ of *x* = 5

⇒

⇒

∴ *x* = (5 16) = 80

Hence, the required number is 80.

i 0.8% of 45 =

=

=

Hence, 0.8% of 45 is 0.36.

Question:70

A number is increased by 10% and the increased number is decreased by 10%. Show that the net decrease is 1%.

Solution:

Let *x* be the number.

The number is increased by 10%.

∴ Increased number = 110% of *x* =

The number is, then, decreased by 10%.

∴ Decreased number = 90% of =

Net decrease =

Net decrease percentage =

Question:71

The value of a machine depriciates at the rate of 10% per annum. If its present value is Rs 10000, what will be its value after 2 years?

Solution:

The present value of the machine = Rs 10000

The decrease in its value after the 1^{st} year = 10% of Rs 10000

= Rs = Rs 1000

The depreciated value of the machine after the 1^{st} year = Rs 10000 – 1000 =Rs 9000

The decrease in its value after the 2^{nd} year = 10% of Rs 9000

= Rs = Rs 900

The depreciated value of the machine after the 2^{nd} year = Rs 9000 – 900 = Rs 8100

Hence, the value of the machine after two years will be Rs 8100.

Question:72

The population of a town increases at 5% per annum. Its present population is 16000. What will be its population after 2 years?

Solution:

The present population of the town = 16000

Increase in population after 1 year = 5% of 16000

= = 800

Thus, population after one year = 16000 + 800 = 16800

Increase in population after 2 years = 5% of 16800

= = 840

Increased population after two years = 16800 + 840 = 17640

Hence, the population of the town after two years will be 17,640.

Question:73

The price of a teaset is increased by 5%. If the increased price is Rs 441, what is its original price?

Solution:

Let us assume that the original price of the tea set is Rs. x

Increase in it = 5%

So, value increased on the tea set = 5% of Rs. x

= Rs. = Rs.

Then, increased price of the tea set = Rs.

= Rs. = Rs.

However, increased price = Rs. 441
Then, Rs. = Rs. 441
∴ x = = 420
Hence, the original price of the tea set is Rs 420

Question:74
Mark ✓ against the correct answer
expressed as a fraction is

a
b
c
d
Solution:
b

= =

Question:75
Mark ✓ against the correct answer
If x% of 75 = 12, then the value of x is

a 8
b 10
c 12
d 16
Solution:
c 12

Given that x% of 75 = 12
Then,
⇒ x = =16
Hence, the value of x is 16

Question:76
Mark ✓ against the correct answer
A number increased by 20% gives 30. The number is

a 150
b 6
c 25
d 60
Solution:
c 25

Let the number be *x*. Then, we have:
120% of *x* = increased number
⇒ 30 =
⇒ 30 =
⇒ *x* =
Hence, the required number is 25

Question:77
Mark ✓ against the correct answer
5% of a number is 9. The number is

a 120
b 140
c 160
d 180
Solution:
d 180

Let the required number be *x.* Then, we have:
5% of *x* = 9
⇒
⇒ *x* =

Question:78
Mark ✓ against the correct answer
If 35% of a number added to 39 is the number itself, the number is

a 60
b 65
c 75

d 70

Solution:

a 60

Let the number be x.

According to question, we have:

(35% of x) + 39 = x

⇒

⇒

⇒

⇒

⇒

∴ x = = 60

Hence, the required number is 60.

Question:79

Mark ✓ against the correct answer

In an examination it is required to get 36% to pass. A student gets 160 marks and fails by 20 marks. The maximum marks are

a 400

b 450

c 500

d 600

Solution:

c 500

Let x be the maximum marks.

Pass marks = 160 + 20 = 180

∴ 36% of x = 180

⇒

⇒ x =

Hence, maximum marks = 500

Question:80

Fill in the blanks.

i 3 : 4 = ...%

ii 0.75 = ...%

iii 6% = ... express in decimals

iv If x decreased by 40% gives 135, then x = ...

v (11% of x) – (7% of x) = 18 ⇨ x = ...

Solution:

We have the following:

i 3 : 4 = (75)%

Explanation: 3 : 4 = =

ii 0.75 = (75)%

Explanation: (0.75 100)% = 75%

iii 6% = 0.06 expressed in decimals

Explanation: 6% =

iv If x decreased by 40% gives 135, then x = 225

Explanation:

Let the number be x.

According to question, we have:

x – 40% of x = 135

⇒

⇒

⇒

⇒ x = = 225

v (11% of x) – (7% of x) = 18

⇒ x = 450

Explanation:

(11% of x) – (7% of x) = 18

⇒

⇒

∴ x =

Question:81

Write 'T' for true and 'F' for false

i as rate per cent is 75%

ii expressed as a fraction is

iii 2 : 5 = 25%

iv 80 % of 450 = 360.

v 20% of 1 litre = 200 mL.

Solution:

i True T

Justification: = 75%

ii True T

Justification: =

iii False F

Justification: = % = = 40%

iv True T

Justification: 80% of 450 =

v True T

Justification: 20% of 1 L = 20% of 1000 mL

= mL = 200 mL