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$\frac{37}{16}\% = \frac{37}{16 \times 100}$

$= \frac{37}{1600}$

* To Convert a fraction into a percentage

i) $\frac{11}{16}$

$\frac{11}{16} = \left[\frac{11}{16_4} \times \cancel{100}^{25}\right]\% = \frac{275}{4}\% = 68\frac{3}{4}\%$

ii) $3\frac{2}{3}$

$3\frac{2}{3} = \frac{11}{3}\left[\frac{11}{3} \times 100\right]\% = \frac{1100}{3}\% = 336\frac{2}{3}\%$

iii) $\frac{7}{4}$

$\frac{7}{4} = \left[\frac{7}{\cancel{4}_1} \times \frac{50}{\cancel{100}}\right]\%$

$= (7 \times 50)\%$

$= 175\%$

* To Convert a percentage into a ratio

(i) 32%

$32\% = \frac{32}{100} = \frac{8}{25} = 8:25$

(ii) $6\frac{5}{7}\%$

$6\frac{5}{7}\% = \frac{47}{7}\% = \frac{47}{7 \times 100} = \frac{47}{700}$ $\therefore 47:700$

(iii) 27.5%

$27.5\% = \frac{27.5}{100} = \frac{275}{1000} = \frac{11}{40}$ $\therefore 11:40$

(iv) 175%

$175\% = \frac{175}{100} = \frac{7}{4} = 7:4$

* To Convert a ratio into a percentage

(i) 23 : 40

$23:40 = \frac{23}{40} = \left[\frac{23}{2\cancel{40}} \times \cancel{100}^{5}\right]\% = \frac{115}{2}\%$

$\frac{115}{2}\% = 57\frac{1}{2}\%$

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143 : 125

$143 : 125 = \frac{143}{125} = \left[\frac{143}{125} \times \frac{100}{5}\right]\% = \frac{572}{5}\%$

$\frac{572}{5}\% = 114\frac{2}{5}\%$

$6\frac{2}{5} : 8\frac{4}{15}$

$\left[\frac{32}{5}\right]$

$\left[\frac{124}{15}\right]$

$= \left[\frac{32}{5} \times \frac{15}{124}\right]$

$\frac{24}{31} = \left[\frac{24}{31} \times 100\right]\% = \frac{2400}{31}\%$

To Convert a percentage into a decimal:

73%

$73\% = \frac{73}{100} = 0.73$

$6\frac{2}{5}\%$

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$\frac{6 \times 5 + 2}{5}$ %.

$\frac{30+2}{5}$ %.

$\frac{32}{5}$ % $= \frac{32}{5 \times 100} = \frac{8}{125} = 0.064$

iii) $116\frac{2}{3}$ %.

$116\frac{2}{3}$ % $= \frac{350}{3}$ % $= \frac{35^{7}\cancel{0}}{3 \times \cancel{10}\,\cancel{0}} = \frac{7}{6} = 1.16$

iv) 32.5%.

$32.5\% = \frac{32\cancel{5}^{13}}{\cancel{1000}\,40} = \frac{13}{40} = 0.325$

* To Convert a decimal into a percentage

i) 0.37

$0.37 = \frac{37}{100} = \left[\frac{37}{100} \times 100\right]\% = 37\%$.

ii) 1.23

$1.23 = \frac{123}{100}$ $\left[\frac{123}{100} \times 100\right]\%$. $= 123\%$.

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0·0025

$0·0025 = \frac{25}{10000} = \left[\frac{25}{10000} \times 100\right]\% = \frac{25}{100}\%$

$\frac{25}{100}\% = 0.25\%$

Find $2\frac{3}{5}\%$ of 1·4 Kg

$2\frac{3}{5}\%$ of 1·4 Kg

$\frac{13}{5}\%$ of $(1·4 \times 1000)$g

$\left[\frac{13}{5} \times \frac{1}{100} \times 1400\right]$g

$= \frac{182}{5}$g $= 36·4$g

If 8·5% of a number is 68, find the number.

Let the required number be x, Then,

8·5 of x = 68

$\frac{8·5}{100} \times x = 68$

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$\frac{85}{1000} \times x = 68$

$x = \left[\frac{\cancel{8} \times 1000^{\cancel{1000}}}{\cancel{85}_{1}}\right] = \cancel{800}$

$x = \left[\frac{68 \times 1000}{85}\right] = 800$

* (i) what per cent of 84 is 7?

i) Let x % of $84 = 7$

$\frac{x}{100} \times 84 = 7$

$x = \left[\frac{7 \times 100}{84}\right] = \frac{25}{3} = 8\frac{1}{3}$

Hence, $8\frac{1}{3}$ % of 84 is 7

ii) what per cent of 80 is 92?

Let x % of $80 = 92$

$\frac{x}{100} \times 80 = 92$

$x = \left[\frac{92 \times 100}{80}\right] = 115$

Hence, 115 % of 80 is 92.

* i) what per cent of 2.8 kg is 70 g?

i) Let x % of 2.8 kg = 70 g

$\frac{x}{100} \times (2.8 \times 1000)\,g = 70\,g$

$28x = 70$

$x = \frac{70}{28} \; 5 = 2.5$

2.5 % of 2.8 kg is 70 g.

ii.) what per cent of 4.5 litres is 90 ml?

iii) Let x % of 4.5 l = 90 ml

$\frac{x}{100} \times (4.5 \times 1000)\,ml = 90\,ml$

$45x = 90$

$x = \frac{90}{45}\ 2$

$x = 2$

2 % of 4.5 l is 90 ml

* what per cent of 2 rupees 60 Paise is 15 paise?

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Let x % of (2 rupees 60 Paise) = 15 Paise

$\frac{x}{100} \times 260 \text{ Paise} = 15 \text{ Paise}$

$\frac{13x}{5} = 15$

$x = \frac{15 \times 5}{13} = \frac{75}{13} = 5\frac{10}{13}$

$5\frac{10}{13}$ % of (2 rupees 60 Paise) is 15 Paise.

* $\frac{2}{3}$ is what per cent of $\frac{4}{9}$?

Let x % of $\frac{4}{9} = \frac{2}{3}$

$\frac{x}{100} \times \frac{4}{9} = \frac{2}{3}$

$\frac{x}{225} = \frac{2}{3}$

$x = \frac{2}{3} \times 225^{75}$

$x = 2 \times 75$

$x = 150$

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Hence, 150% of $\frac{4}{9}$ is $\frac{2}{3}$

Increasing or decreasing a Quantity by a Certain per cent

Increase 360 by 15 %.

Required number $= \left[1 + \frac{15}{100}\right] \times 360$

$= \left[\frac{115}{100} \times 360\right] = 414$

Decrease 240 by 10%.

Required number $= \left[1 - \frac{10}{100}\right] \times 240$

$= \left[\frac{9}{10} \times 240\right] = 216$

what is the number which when increased by 15% becomes 414?

Let the required number be x

$\left[1 + \frac{15}{100}\right] x = 414$

$\frac{115}{100} x = 414$

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$$x = \left[414 \times \frac{100}{115}\right] = 360$$

Hence the required number is 360.

iv.) On decreasing a number by 18% it becomes 779. Find the number.

Let the required number be x

$$\left[1 - \frac{18}{100}\right] x = 779$$

$$\frac{41x}{50} = 779$$

$$x = \left[779 \times \frac{50}{41}\right] = 950$$

Hence, the required number is 950

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Percentage

Exercise 9-A

Convert each of the following into a fraction :-

68 %.

$\frac{68}{100} \quad \frac{34}{50} \quad \frac{17}{25} = \frac{17}{25}$

$3\frac{1}{3}$ %.

$\frac{3 \times 3 + 1}{3}$ %.

$\frac{9+1}{3}$ %.

$\frac{10}{3}$ %.

$\frac{1\text{¢}}{3 \times 10\text{¢}}$

$\frac{1}{3 \times 10}$

$\frac{1}{30}$

iii) 224 %

$\frac{224}{100}$ = $\frac{56}{25}$

$\frac{56}{25} = 2\frac{6}{25}$

iv) 0.05 %

$\frac{0.05}{100} \times \frac{1}{20}$

$= \frac{1}{100 \times 20}$

$= \frac{1}{2000}$

Q-2 Convert each of the following into a percentage :-

i) $\frac{2}{15}$

$\frac{2}{15} \times \frac{20}{1}$

$\frac{40}{3}$ %

$13\frac{1}{3}$ %

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ii) $\frac{9}{40}$

$\frac{9}{2\cancel{40}} \times \overset{5}{\cancel{10}}\%$

$\frac{9 \times 5}{2}\%$

$\frac{45}{2}\%$

$22\frac{1}{2}\%$

iii) $1\frac{2}{3}\%$

$\frac{3 \times 1 + 2}{3}\%$

$\frac{3+2}{3}\%$

$\frac{5}{3}\%$

$\frac{5}{3} \times 100$

$\frac{500}{3}\%$

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$168\frac{2}{3}\%$

(iv) $2\frac{2}{5}$

$\frac{2\times5+2}{5}$

$\frac{10+2}{5}$

$\frac{12}{5}$

$\frac{12}{\cancel{5}_{1}} \times \cancel{100}^{20}$

$12\times20\%$

240%

Ques 3 Express each of the following ratios as a percentage :-

(i) $B:20$

$\frac{13}{\cancel{x}} \times \frac{\cancel{5}}{\cancel{\phi}}$

13×5

65%

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ii.) 11 : 18

$\frac{11}{18} \times 100^{50}$

$\frac{220}{9}$

$61\frac{1}{9}\%$

iii.) 87 : 25

$\frac{87}{25} \times 100^{4}$

$= 87 \times 4\%$

$= 348\%$

Ques-4

(i)

iv) $6\frac{1}{4} : 4\frac{3}{8}$

$\frac{6\times4+1}{4} : \frac{4\times8+3}{8}$

$\frac{24+1}{4} : \frac{32+3}{8}$

$\frac{25}{4} : \frac{35}{8}$

ii.)

$\frac{25}{4} \div \frac{35}{8}$

$\frac{25}{4} \times \frac{8}{35}$

$\frac{5}{1} \times \frac{2}{7}$

$\frac{5 \times 2}{7}$

$\frac{5 \times 100}{7}$ %

$\frac{500}{7}$ %

$71\frac{3}{7}$ %

Ques 4 Express each of the following decimals as a percentage :-

(i) 0

$\frac{6}{100} \times 100\%$

6%

(v) 0.008

$\frac{8}{1000} \times 100\%$

$= 0.8\%$

(vi) 2.4

$\frac{24}{10} \times 100\%$

$24 \times 10\%$

240%

Q.no 5 Express each of the following percentages as a decimal :-

(i) 25%

$\frac{25}{100}$

0.25

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$\frac{4}{100}$

0.04

iii.) $3\frac{1}{5}\%$

$\frac{3 \times 5 + 1}{5}$

$\frac{15 + 1}{5}$

$\frac{16}{8 \times 100} \frac{8}{50} \frac{4}{25}$

$\frac{4}{125}$

0.032

iv.) 0.3%

$\frac{0.3}{10 \times 100}$

$\frac{3}{1000}$

0.003

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Q.6 Express each of the following as a ratio

(i) 48 %.

$\frac{48}{100} \quad \frac{24}{50} \quad \frac{12}{25}$

12 : 25

(ii) $26\frac{2}{3}$ %.

$26 \times \frac{26 \times 3 + 2}{3}$ %.

$\frac{78+2}{3}$ %.

$\frac{80}{3 \times 100} \quad \frac{4}{5}$

$\frac{4}{3 \times 5}$

$\frac{4}{15}$

4 : 15

(iii) 0.06 %.

$\frac{6}{100} \times \frac{3}{50}$

$\frac{3}{100} \times 50$

$\frac{3}{5000}$

3 : 5000

(iv.) 120%

$\frac{6}{120} \times \frac{1}{100}$

5 : 100

6 : 5

Q.7 Find the value of :-

(i) 33% of ₹ 50

₹ 1 = 100 P

₹ 50 P = 100 × 50
= 5000 P

$\frac{33}{100} \times 500$

33 × 5 = 165 P = ₹ 16.50

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ii) $6\frac{2}{3}\%$ of 3m

1m = 100cm

3m = 3 × 100cm
= 300cm

$6\frac{2}{3}\% = \frac{6 \times 3 + 2}{3}\%$

$= \frac{18+2}{3}\%$

$= \frac{20}{3}\%$

$\frac{20}{3 \times 100} \times 300$

20cm

iii) 0.6% of 35kg

1kg = 1000gm

35kg = 1000 × 35 gm
= 35000gm

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$\frac{6}{100} \times 3500$

35×6

210 g

iv) $3\frac{1}{4}\%$ of 5 l

1 l = 1000 ml

5 l = 1000×5 ml
= 5000 ml

$3\frac{1}{4}\% = \frac{3\times4+1}{4}\%$

$= \frac{12+1}{4}\%$

$= \frac{13}{4}\%$

$\frac{13}{4}\% = \frac{13}{4\times100}$

$= \frac{13}{24} \times \frac{25}{500}$

$= \frac{325}{2}$ 162.5 = 162.5 ml

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3(i) what per cent of ₹9 is ₹5?

Let x% of ₹9 = ₹5

$\frac{x}{100} \times ₹9 = ₹5$

$x = \left[₹5 \times \frac{100}{₹9}\right]$

$x = \left[\frac{500}{9}\right] = 55\frac{5}{9}\%$

ii) what per cent of 32m is 80m?

Let x% of 32m = 80m

$\frac{x}{100} \times 32m = 80m$

$x = \frac{\overset{10}{\cancel{80}}m \times \overset{25}{\cancel{100}}m}{\underset{8}{\cancel{32}}}$

$= 10 \times 25\%$

$= 250\%$

iii) what per cent of 50 kg is 65 kg?

Let x% of 50 kg = 65 kg

$\frac{x}{100} \times 50kg = 65kg$

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$x = 65\,kg \times \frac{2}{130}$

$x = 65 \times 2$

$x = 130\%$

iv.) what per cent of 5 litres is 400ml?

iv.) Let $x\%$ of $5l = 400ml$

$1l = 1000ml$

$5l = 1000 \times 5\,ml$

$= 5000ml$

$\frac{x}{100} \times 5000 = 400ml$

$x = \frac{8}{400} \times \frac{4}{100}$

$x = 8\%$

Ques 9

i) If 8% of a number is 24, find the number.

ii) 8% of $x = 24$

$\frac{8}{100} \times x = 24$

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$\frac{8}{100} \times x = 24$

$x = 24^{3} \times \frac{100}{8_{1}}$

$x = 3 \times 100$

$x = 300$

ii.) If 7·25% of a number is 2·9, find the number.

ii.) 7·25% of $x = 2·9$

$\frac{7{}^{1}25}{100 \times 100} \times x = 2·9$

$\frac{725}{100 \times 100} \times x = 2·9$

$x = \frac{29{}^{1}}{1\cancel{0}} \times \frac{\cancel{100}^{20} \times \cancel{10}^{2}}{\cancel{725}\ \cancel{145}\ 29_{1}}$

$x = 20 \times 2$

$x = 40$

iii.) If $6\frac{2}{3}\%$ of a number is 1, find the number.

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(iii) Let $6\frac{2}{3}\%$ of $x = 1$

$\frac{20}{3}\% \times x = 1$

$\frac{20}{3 \times 100} \times x = 1$

$x = 1 \times \frac{3 \times 100^{5}}{20}$

$x = 1 \times 3 \times 5$

$x = 15$

Question

(i) Increase 75 by 24%

Required number $= \left[1 + \frac{24}{100}\right] \times 75$

$= \frac{124^{31}}{100_{25}} \times 75^{3}$

$= 31 \times 3$

$= 93$

(ii) Decrease 375 by 8%.

(i) Required number $= \left(1 - \frac{8}{100}\right) \times 375$

$= \left(\frac{100-8}{100}\right) \times 375$

$= \left(\frac{92}{100}\right) \times 375$

$= \frac{\overset{46}{92} \times \overset{75}{375}}{\underset{20}{100} \times 4} = \frac{23 \times 15}{1}$

$= 23 \times 15$

$= 345$

what number when increased by 15% becomes 276?

Let the required number be x

Then, $\left[1 + \frac{15}{100}\right] x = 276$

$\frac{115}{100} x = 276$

$x = \frac{276^{12} \times \cancel{100}^{20}}{\cancel{115}_{23}_{1}}$

$= 12 \times 20$

$= 240$

what number when decreased by 8% becomes 345?

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Let the required number be x

$$\left[1 - \frac{8}{100}\right] x = 345$$

$$\frac{92x}{100} = 345$$

$$x = \frac{345^{15} \times 100}{92} \quad 50 \; 25$$

$$x = 15 \times 25$$

$$x = 375$$

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Exercise 6-B

Word Problems:-

36% of the students in a school are girls. If the number of boys is 1440, find the total strength of the school.

Number of boys = 1440

Number of girls = 36%

Boys = 100% - 36% = 64%

Let strength of school be x

64% of x = 1440

$$\frac{64}{100} \times x = 1440$$

$$\frac{64x}{100} = 1440$$

$$x = \frac{\cancel{1440}^{\cancel{180}^{45}} \times \cancel{100}^{50}}{64_{8}2_{1}}$$

$$x = 45 \times 50$$

$$x = 2250$$

Passing Percentage = 40%

Rahul marks = 178

Fail marks = 32

Let total marks be x

Passing marks $\frac{40}{100} \times x = 0.4x$

$0.4x = 178 + 32$

$0.4x = 210$

$x = \frac{210}{0.4} = \frac{2100}{4}$ 525

4) 8% of the students in a school remained absent on a day. If 1633 attended the school on that day, how many remainded absent?

Percentage of absent students = 8%.

No. of students attended school on that day = 1633

No of absentities = 100% - 8%
= 92%.

92% of x = 1633

Let the original price of an article be x

Decrease in price = 6%.

Decreased Price = ₹ $\left[100 - \frac{6}{100}\right]$

= ₹ $\left[\frac{94}{100}\right]$

But decreased price = ₹1551

$\therefore \frac{94x}{100} = 1551$

$94x = 1551 \times 100$

$94x = 155100$

$x = \frac{155100}{94}$ 1650

$x = ₹1650$

→ Renu reduced her weight by 15%. If now she weighs 52.7 kg, what was her earlier weight?

Percentage of reduced weight = 15%.

New weight = 52.7 kg

old weight = 100 kg + 15 kg

= 85 kg

85% of x = 51 kg

$\frac{85}{100} \times x = 51$ kg

$x = \frac{51}{1} \times \frac{100}{85}$

$x = 3 \times 20$

$= 60$ kg

8) Two Candidates Contested an election. one of them secured 58% votes and won the election by a margin of 2586 votes. How many votes were polled in all?

Let total votes polled be x

$x = \frac{2580}{58} \times \frac{100}{29}$

one of them secured votes = 58%

other secured votes = 100% - 58%

= 42%

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58% of x - 42% of x = 2560

$\frac{58}{100} x - \frac{42}{100} x = 2560$

$\frac{58x - 42x}{100} = 2560$

$\frac{16x}{100} = 2560$

$x = \frac{2560 \times 100}{16}$

$x = 16000$

9.) In an examination, Preeti scored 60 out of 75 in science, 84 out of 100 in mathematics, 36 out of 50 in Hindi and 30 out of 45 in english.

(i) In which subject her peformance is worst?

(ii) In which subject her peformance is the best?

(iii) what is her aggregate percentage of marks?

Percentage of marks in science $= \frac{60}{75} \times 100\%$

$= 4 \times 20\%$

$= 80\%$

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Percentage of marks in mathematics $= \frac{84}{100} \times 100\%$

$= 84\%$

Percentage of marks in Hindi $= \frac{36}{150} \times 100\%$

$= 36 \times 2\%$

$= 72\%$

Percentage of marks in English $= \frac{300}{450} \times 100\%$

$= \frac{200}{3}\%$

$= 66.6\%$

Average percentage $= \frac{84\% + 84\% + 72\% + 66.6\%}{4}$

$= \frac{302.6}{4}\%$

$= 75.65\%$

(Q2) The price of an article is increased by 25%. By how much per cent must this new value be decreased to restore it to its former value?

Let the original number be x

Increased number $= \left[1 + \frac{25}{100}\right] x$

$= \frac{125}{100} x$

$= \frac{5}{4} x$

To restore its formal value reduction required $= \frac{5}{4} x - x$

$= \frac{5x - 4x}{4}$

$= \frac{x}{4}$

Percentage reduction $= \left[\frac{\frac{x}{4}}{\frac{5x}{4}}\right] \times 100\%$

$= \left[\frac{x}{x} \times \frac{4}{5x}\right] \times 100\%$

$= 20\%$

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11) The price of an article is reduced by 10%. By how per cent must this new value be increased to restor it to its former value?

Let the original price be x

Decreased Price $= \left[1 - \frac{10}{100}\right] x$

$= \frac{9\cancel{0}\, x}{10\cancel{0}}$

$= \frac{9x}{10}$

To restore its formal value

Increament required $= x - \frac{9x}{10}$

$= \frac{10x - 9x}{10}$

$= \frac{x}{10}$

Percentage Increament $= \left[\frac{\frac{x}{10}}{\frac{9x}{10}}\right] \times 100\%$

11) The price of an article is reduced by 10%. By how per cent must this new value be increased to restore it to its former value?

Let the original price be x

Increased Price = $\left[1 - \frac{10}{100}\right] x$

$= \frac{90}{100} x$

$= \frac{9}{10} x$

To restore its former value

Increment required = $x - \frac{9x}{10}$

$= \frac{10x - 9x}{10}$

$= \frac{x}{10}$

Percentage Increment = $\left[\frac{\frac{x}{10}}{\frac{9x}{10}}\right] \times 100\%$

$= \frac{1}{14} \times \frac{14}{99} \times 100\%$

$= \frac{100}{9}\%$

$= 11\frac{1}{9}\%$

12.) The price of tea is increased by 20%. By How much per cent this ~~should be increased to~~ a housewife should reduce the Consumption of tea so as not to increase the expenditure on tea?

Let the original price be $₹x$

Increased Price $= \left[1 + \frac{20}{100}\right] x$

$= \frac{12}{5} x$

$= \frac{6x}{5}$

Reduction Required $= \frac{6x}{5} - x$

$= \frac{6x - 5x}{5}$

$= \frac{x}{5}$

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Percentage reduction = $\left[\frac{x - \frac{2x}{5}}{x}\right] \times 100\%$

$= \frac{x}{5} \times \frac{5}{4x} \times 100^{50}\%$

$= \frac{50}{3}\% = 16\frac{2}{3}\%$

13) A man gave 35% of his money to his elder son and 40% of the remainder to the younger son. Now, he is left with ₹ 1170. How much money he had?

Let he had money = ₹ x

Elder son share's = 35% of x

$= \frac{35}{100} \times x$

$= \frac{7x}{20}$

Remaining money = $x - \frac{7x}{20}$

$= \frac{20x - 7x}{20}$

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$= \frac{13x}{20}$

Younger son share = 40% of $\frac{13x}{20}$

$= \frac{40}{100} \times \frac{13x}{20}$

$= \frac{13x}{50}$

Money left with him $= \frac{13x}{20} - \frac{13x}{50}$

$= \frac{13x \times 5 - 13x \times 2}{100}$

$= \frac{65x - 26x}{100}$

$= \frac{39x}{100}$

$\frac{39x}{100} = 11700$

$x = 11700 \times \frac{100}{39}$

$= 30000$

(a) 5% of the population of a small village in Ekiti in one earthquake and 2% of the remainder left the town. If the population of the town is 4370, what was its population at the beginning?

Let the total population in the village be x

Died in earthquake $= \frac{5x}{100} = \frac{x}{20}$

Remaining $= x - \frac{5x}{100} = \frac{x - x}{20}$

$= \frac{19x}{20}$

Left the town $= \frac{8}{100} \times \frac{19x}{20}$

$= \frac{19x}{250}$

Now remaining in town $= \frac{19x}{20} - \frac{19x}{250}$

$= \frac{19x}{256}$

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$$= \frac{475x - 38x}{500}$$

$$= \frac{437x}{50}$$

$$\therefore \frac{437x}{500} = 43700$$

$$\frac{100}{}$$

$$x = \frac{43700 \times 500}{437 \; 1}$$

$$x = 50{,}000$$

A and B are two towers. The height of tower A is 20% less than that of B. How much percent is B's height more than that of A?

Let $B = x$

$$A = x - \frac{26}{100} \times x$$

$$= x - 0.2x$$

$$= 0.8x$$

$$\% = \frac{\text{Height of B} - \text{Height of A} \times 100}{\text{Height of A}}$$

$$\% = \frac{x - 0.8x \times 100}{0.8x}$$

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$$\% = \frac{0.2x}{0.8x} \times 100$$

$$\% = \frac{1}{4} \times 100^{25}$$

$$\% = 25\%$$

∴ Height of B is 25% more than A.

b) In an examination 30% of the Candidates failed in English 35% failed in G.K and 27% failed in both the subjects. If 30 students passed in both how many candidates appeared in the exam?

Let the total students be x

∴ failed in english = 30% of x

$$= \frac{30x}{100}$$

Failed in G.K = 35% of x

$$= \frac{35x}{100} = \frac{7x}{20}$$

Failed in both = 27% of x

$$= \frac{27x}{100}$$

Failed in both = 27% of x

$= \frac{27x}{100}$

Total no. failed $= \left(\frac{3x}{10} + \frac{7x}{20}\right) - \frac{27x}{100}$

$= \left(\frac{6x+7x}{20}\right) - \frac{27x}{100}$

$= \frac{65x-27x}{100} = \frac{19x}{50}$

Total no. of Candidates $= 310 + \frac{19x}{50}$

$= \frac{1550+19x}{50}$

$50x - 19 = 1550$

$31x = 1550$

$x = \frac{1550}{31}$

$x = 300$

17.) The value of a car of depriciates annually by 10% of the present value of the Cars be ₹ 650000 find what will be the population after two years.

Compound Interest

Past value = Present value = Present value $\left[1 + \frac{r}{100}\right]^n$

$x = 65000\left[1 + \frac{4}{100}\right]^2$

$x = 65000 \times \frac{26}{100} \times \frac{26}{100}$

$x = \$ 26,260$

2) The population of a village increases by 2% every year. If the present population is $8000 then what will be the population after two years?

Past value = Present value $\left[1 + \frac{r}{100}\right]^n$

$x = 8000\left[1 + \frac{2}{100}\right]^2$

$x = 8000 \times \frac{102}{100} \times \frac{102}{100}$

$x = \$ 31,592$

3) A student was asked to multiply a number by $\frac{5}{3}$ he multiplied by $\frac{3}{5}$ instead. Find the percentage error in his Calculation.

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Let the number be x

$$\frac{5}{3}x - \frac{3}{5}x$$

$$= \frac{25x - 9x}{15}$$

$$= \frac{16x}{15}$$

$$= \frac{16x}{15} \times \frac{21}{5x} \times 100$$

$$= \frac{16}{25} \times 100^{4}$$

$$= 16 \times 4 = 64\%$$

20) In an election between two Candidates 10% of the votes did not Cast their votes. 10% of the votes polled were found invalid. The successful Candidate got 54% of the valid vote and won by a majority of 1620 votes. find the number of voters enrolled on the voters list.

Let the voters be x

Not voted = 10% of x

$$= \frac{x}{10}$$

total votes polled = $x - \frac{x}{10}$

$= \frac{9x}{10}$

Invalid votes = 10% of $\frac{9x}{10}$

$= \frac{9x}{100}$

number of valid votes = $\frac{9x}{10} - \frac{9x}{100}$

$= \frac{81x}{100}$

votes obtained by a winner = 54% of x

$= \frac{81x}{100}$

votes obtained by loser = 46% of $\frac{81x}{100}$

ATQ, $\frac{54}{100} \times \frac{81x}{100} - \frac{46}{100} \times \frac{81x}{100} = 1620$

$\frac{54 \times 81x}{10000} = \frac{46 \times 81x}{10000}$

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$$\frac{8 \times 81x}{10000} = 1620$$

$$\frac{8x}{10000} = 20$$

$$8x = 200000$$

$$x = 25000$$