Exercise 11.1

Q1. Express each of the following per cents as fractions in the simplest forms:

(i) 45%

$= \frac{45}{100}$

$= \frac{9}{20}$

(ii) 0.25%

$= \frac{0.25}{100}$

$= \frac{25}{10000}$

$= \frac{1}{400}$

(iii) 150%

$= \frac{150}{100}$

$= \frac{3}{2}$

(iv) $6\frac{1}{4}$ *%*

$= \frac{6.25}{100}$

$= \frac{625}{10000}$

$= \frac{1}{16}$

Q2. Express each of the following fractions as a per cent:

(i) $\frac{3}{4}$ *%*

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

$= 75\%$

(ii) $\frac{53}{100}$ *%*

$= \left(\frac{53}{100} \times 100\right)\%$

$= 53\%$

(iii) $1\frac{3}{5}$ *%*

$= \frac{8}{5}$

$= (1.6 \times 100)\%$

$= 160\%$

(iv) $\frac{7}{20}$ *%*

$= \left(\frac{7}{20} \times 100\right)\%$

$= 35\%$

Exercise 11.2

Q1. Express each of the following ratios as per cents

(i) 4:5

$= \frac{4}{5}$

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

=80%

(ii) 1:5

$= \frac{1}{5}$

$= \left(\frac{1}{5} \times 100\right)\%$

=20%

(iii) 11:125

$= \frac{11}{125}$

$= \left(\frac{11}{125} \times 100\right)\%$

$= \frac{44}{5}\%$

Q2. Express each of the following per cents as ratios in simplest forms

(i) 2.5%

$\frac{2.5}{100}$

$= \frac{25}{1000}$

$= \frac{1}{40}$

(ii) 0.4%

$\frac{0.4}{100}$

$= \frac{4}{1000}$

$= \frac{1}{250}$

(iii) $13\frac{3}{4}\%$

$\frac{13.75}{100}$

$= \frac{1375}{10000}$

$= \frac{11}{80}$

Exercise 11.3

Q1. Express each of the following per cents as decimals:

(i) 12.5%

$\frac{12.5}{100}$

$= 0.125$

(ii) 75%

$\frac{75}{100}$

$= 0.75$

(iii) 128.8%

$\frac{128.8}{100}$

$= 1.288$

(iv) 0.05%

$\frac{0.05}{100}$

$= 0.0005$

Q2. Express each of the following decimals as per cent:

(i) 0.004

$\frac{4}{1000}$

$= \left(\frac{4}{1000} \times 100\right)\%$

$= 0.4\%$

(ii) 0.24

$$\frac{24}{100}$$

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

$$= 24\%$$

(iii) 0.02

$$\frac{2}{100}$$

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

$$= 2\%$$

(iv) 0.275

$$\frac{275}{1000}$$

$$= \left(\frac{275}{1000} \times 100\right)\%$$

$$= 27.5\%$$

Q3. Write each of the following as whole numbers or mixed numbers:

(i) 136%

$$= \frac{136}{100}$$

$$= \frac{34}{25}$$

(ii) 250%

$$= \frac{250}{100}$$

$$= \frac{5}{2}$$

(iii) 300%

$$= \frac{300}{100}$$

$$= 3$$

Exercise 11.4

Q1. Find each of the following:

(i)7% of Rs.7150

$Rs.\left(\frac{7}{100}\times 7150\right)$

$=Rs.500.50$

(ii) 40% of 400Kg

$Kg.\left(\frac{40}{100}\times 400\right)$

$=160Kg$

(iii) 20% 0f 15.125litres

$litres.\left(\frac{20}{100}\times 15.125\right)$

$=3.025litres$

(iv) $3\frac{1}{3}$ *% of 90km*

$km.\left(\frac{10}{300}\times 90\right)$

$=3km$

(v) 2.5% of 600metres

$metres.\left(\frac{2.5}{100}\times 600\right)$

$=15metres$

Q2. Find the number whose $12\frac{1}{2}$ % is 64.

Let the required number be x. Then,

$12\frac{1}{2} \times x = 64$

$12.5\% \times x = 64$

$\frac{12.5}{100} \times x = 64$

$x = \frac{64 \times 100}{12.5}$

$= 64 \times 8 = 512$

$Therefore\ x = 512$

Q3. What is the number, $6\frac{1}{4}$ % of which is 2?

Let the required number be x. Then,

$6\frac{1}{4} \times x = 2$

$6.25\% \times x = 2$

$\frac{6.25}{100} \times x = 2$

$x = \frac{2 \times 100}{6.25}$

$= 2 \times 16 = 32$

$Therefore\ x = 32$

Q*4. If 6 is 50% of a number, what is the number?*

Let the required number be x. Then,

$50\%\ of\ x = 6$

$\frac{50}{100} \times\ x = 6$

$x = \frac{300 \times 2}{50}$

$\frac{600}{50} = 12$

$x = 12$

Exercise 11.5

Q1. What per cent of

(i) 24 is 6?

$Required\ percentage = \frac{6}{24} \times 100$

$= \frac{100}{4}$

$= 25\%$

$Hence\ 6\ is\ 25\%\ of\ 24$

(ii) Rs.125 is Rs.10?

$Required\ percentage = Rs.\left(\frac{10}{125} \times 100\right)$

$= \frac{1000}{125}$

$= 8\%$

$Hence\ Rs.10\ is\ 8\%\ of\ Rs.125$

(iii) 4km is 160 metres?

$Required\ percentage = km\left(\frac{160}{4} \times 100\right)$

$1km = 1000metres$

$4km = 4000metres$

$km\left(\frac{160}{4000} \times 100\right)$

$\frac{16000}{4000} = 4\%$

$Hence\ 160metres\ of\ 4km\ is\ 4\%$

(iv) Rs.8 is 25 paise?

$We\ know\ that, Rs.1 = 100paise$

$Therefore Rs.8 = 800paise$

$Required\ percentage = paise\left(\frac{25}{800} \times 100\right)$

$= \frac{25}{8}\%$

$= 3.125\%$

$Hence\ 25paise\ is\ 3.125\%\ of\ Rs.8$

(v) 2 days is 8 hours?

We know that,

1day is 24 hours

$hour = \frac{1}{24} day$

$8\ hours = \frac{8}{24} day = \frac{1}{3} day$

$Therefore\ required\ percentage = \frac{\frac{1}{3}}{2} \times 100$

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

$Hence\ 8\ hours\ is\ 16\frac{2}{3}\%\ of\ 2\ days$

(vi) 1 lire is 175ml

We know that

1lire=1000ml

$Therefore\ required\ percentage = \frac{175ml}{1litre}$

$= \frac{175ml}{1000ml} \times 100$

$= 17.5\%$

$Hence\ 175ml\ is\ 17.5\%\ of\ 1\ litre$

Q2. What per cent is equivalent to $\frac{3}{8}$?

$$\frac{3}{8} \times 100$$
$$= \frac{300}{8}$$
$$= 37.5$$

Q3. Find the following:

(i) 8 is 4% of which number

$$let\ x\ be\ the\ required\ number.\ Then,$$
$$4\%\ of\ x = 8$$
$$\left(\frac{4}{100} \times x\right) = 8$$
$$x = \frac{800}{4}$$
$$x = 200$$

(ii) 6 is 60% of which number

$$let\ x\ be\ the\ required\ number.\ Then,$$
$$60\%\ of\ x = 6$$
$$\left(\frac{60}{100} \times x\right) = 6$$
$$x = \frac{600}{6}$$
$$x = 10$$

(iii) 6 is 30% of which number

$let\ x\ be\ the\ required\ number.\ Then,$

$30\%\ of\ x = 6$

$\left(\frac{30}{100} \times x\right) = 6$

$x = \frac{6 \times 100}{30}$

$x = 20$

(iv) 12 is 25% of which number

$let\ x\ be\ the\ required\ number.\ Then,$

$25\%\ of\ x = 12$

$\left(\frac{25}{100} \times x\right) = 12$

$x = \frac{12 \times 100}{25}$

$x = 48$

Q4. Convert each of the following pairs into percentages and find out which is more?

(i) 25 marks out of 30, 35 marks out of 40

$25\ marks\ out\ of\ 30 = \frac{25}{30} \times 100$

$= \frac{250}{3}\%$

$= 83.33\%$

$35\ marks\ out\ of\ 40 = \frac{35}{40} \times 100$

$= \frac{7}{8} \times 100\%$

$= 87.5\%$

Therefore 35 marks out of 40(87.5%) is more than 25 marks out of 30

(ii) 100 runs scored off 110 balls, 50 runs scored off 55 balls

$100\ runs\ scored\ off\ 110\ balls = \frac{100}{110} \times 100$

$= 90.91\%$

$50\ runs\ scored\ off\ 55\ balls = \frac{50}{55} \times 100$

$= 90.91\%$

$Both\ are\ same\ (90.91\%)$

Q5. Find 20% more than Rs.200.

$We\ have$

$20\% of\ Rs.200 = \frac{20}{100} \times 200 = Rs.40$

$Therefore\ 20\%\ more\ than\ Rs.200 = Rs.200 + Rs.40$

$= Rs.240$

Q6. Find 10% less than Rs.150

$We\ have$

$10\% of\ Rs.150 = \frac{10}{100} \times 150 = Rs.15$

$Therefore\ 10\%\ lss\ than\ Rs.150 = Rs.150 + Rs.15$

$= Rs.135$

Exercise 11.6

Q1. Ashu had 24 pages to write. By the evening, he had completed 25% of his work. How many pages were left?

$Total\ number\ of\ pages = 24$

$Number\ of\ pages\ completed = 25\%\ of\ 24\ pages$

$= \frac{25}{100} \times 24$

$= \frac{1}{4} \times 24$

$= 6\ pages$

$Therefore\ no\ of\ pages\ left = Total - Pages\ completed$

$= (24 - 6)\ pages$

$= 18\ pages$

Q2. A box contains 60 eggs. Out of which $16\frac{2}{3}$ % are rotten ones. How many eggs are rotten?

$Total\ number\ of\ eggs = 60$

$Number\ of\ eggs\ rotten = 16\frac{2}{3}\%\ of\ 60\ eggs$

$= 16.66\%\ of\ 60\ eggs$

$= \frac{16.66}{100} \times 60$

$= 10\ eggs$

$Therefore\ no\ of\ eggs\ rotten = 10\ eggs$

Q3. Rohit obtained 45 marks out of 80. What per cent marks did he get?

$Total\ number\ of\ marks = 80$

$Rohit\ obtained = 45$

$Required\ percentage = \frac{45}{80} \times 100$

$= \frac{9}{16} \times 100$

$= 56.25\%$

Q4. Mr Virmani saves 12% of his salary. If he receives Rs 15900 per month as salary, find his monthly expenditure.

$Salary = Rs.15900$

$Savings = 12\%\ of\ salary$

$= \frac{12}{100} \times 15900$

$= Rs.1908$

$Therefore\ Expenditures = Salary - Savings$

$= Rs.15900 - Rs.1908$

$= Rs.13992$

Q5. A lawyer willed his 3 sons Rs 250000 to be divided into portions 30%, 45% and 25%. How much did each of them inherit?

$Total\ amount = Rs.250000$

$Therefore$

$30\%\ of\ amount = \frac{30}{100} \times 250000$

$= 30 \times 2500$

$= Rs.75000$

$45\%\ of\ amount = \frac{45}{100} \times 250000$

$= 45 \times 2500$

$= Rs.112500$

$25\%\ of\ amount = \frac{25}{100} \times 250000$

$= 25 \times 2500$

$= Rs.62500$

$Therefore\ portions\ of\ amounts\ are\ Rs.75000, Rs.112500\ and\ Rs.62500$

Q6. Rajdhani College has 2400 students, 40% of whom are girls. How many boys are there in the college?

$Total\ number\ of\ students = 2400$

$40\%\ of\ 2400 = \frac{40}{100} \times 2400$

$= 40 \times 24$

$= 960 girls$

$Therefore\ no\ of\ boys = Total\ students - girls$

$= 2400 - 960$

$= 1440\ boys$

Q7. Aman obtained 410 marks out of 500 in CBSE XII examination while his brother Anish gets 536 marks out of 600 in IX class examination. Find whose performance is better?

$Aman\ scored\ 410\ marks\ out\ of\ 500$

$= \frac{410}{500} \times 100$

$= 82\%$

$Anish\ scored\ 536\ marks\ out\ of\ 600$

$= \frac{536}{600} \times 100$

$= 89\%$

$Anish\ performance\ is\ better$

Q8. Rahim obtained 60 marks out of 75 in Mathematics. Find the percentage of marks obtained by Rahim in Mathematics.

$Total\ no\ of\ marks = 75$

$Rahim\ obtained = 60$

$Required\ percentage = \frac{60}{75} \times 100$

$= 80\%$

Q9. In an orchard, $16\frac{2}{3}$ % of the trees are apple trees. If the number of trees in the orchard is 240, 3 find the number of other type of trees in the orchard.

$Total\ number\ of\ trees = 240$

$Apple\ trees = 16\frac{2}{3} \times\ 240$

$= 16.66\%\ of\ 240$

$= \frac{16.66}{100} \times 240$

$= 40\ trees$

$No\ of\ trees\ other\ than\ apple\ tree = Total\ trees - apples\ trees$

$= 240 - 40$

$= 40\ trees$

Q10. Ram scored 553 marks out of 700 and Gita scored 486 marks out of 600 in science. Whose performance is better?

$Ram\ obtained\ 553\ out\ of\ 700$

$Ram\ percentage = \frac{553}{700} \times 100$

$= \frac{553}{7}$

$= 79\% Gita\ obtained\ 486\ out\ of\ 600$

$ita\ percentage = \frac{486}{600} \times 100$

$= \frac{486}{6}$

$= 81\%$

$Therefore\ Gita\ performance\ is\ better$

Q11. Out of an income of Rs 15000, Nazima spends Rs 10200. What per cent of her income does she save?

$Total\ income = Rs.15000$

$Savings = Income - Expenditure$

$= Rs.15000 - Rs.10200$

$= Rs.4800$

$Percentage\ of\ income = \frac{4800}{15000} \times 100$

$= 32\%$

Q12. 45% of the students in a school are boys. If the total number of students in the school is 880, find the number of girls in the school.

$Total\ number\ of\ students = 880$

$number\ of\ boys = 45\%\ of\ 880$

$= \frac{45}{100} \times 880$

$= 45 \times 8.8$

$= 396 boys$

$No\ of\ girls = Total\ students - no\ of\ boys$

$= 880 - 396$

$= 484\ girls$

$Therefore\ no\ of\ girls = 484\ girls$

Q13. Mr. Sidhana saves 28% of his income. If he saves As 840 per month, find his monthly income.

$28\% of\ salary = Rs.840$

$Let\ the\ salary\ of\ Mr.\ Sidhana\ be\ x 28\%\ of\ x = 840$

$x = \frac{840 \times 100}{28}$

$= Rs.3000$

$Therefore\ Mr.\ Sidhana\ salary\ is\ Rs.3000$

Q14. In an examination, 8% of the students fail. What percentage of the students pass? If 1650 students appeared in the examination, how many passed?

$Total\ no\ of\ students = 1650$

$8\%\ of\ students\ failed$

$Passed\ students\% = 100\% - 8\%$

$= 92\%$

$Therefore\ number\ of\ students\ passed = 92\%\ of\ 1650$

$= \frac{92}{100} \times 1650$

$= 92 \times 16.5$

$= 1518$

$Therefore\ 1518\ students\ passed$

Q15. In an examination, 92% of the candidates passed and 46 failed. How many candidates appeared?

$92\%\ of\ students\ passed\ means\ 8\%\ students\ failed$

$Let\ the\ number\ of\ students\ be\ x\ then,$

$8\%\ of\ x = 46$

$x = \frac{46 \times 100}{8}$

$= 575$

$Therefore\ total\ number\ of\ students = 575$