Exercise 7.1

1. Express the following percentages as fractions:

(i) 356%

(ii) 2 ½%

(iii) 16 2/2 %

Solution:

(i) 356%

It can be written as

= 356/100

By further simplification

= 89/25

= 3 14/25

(ii) 2 ½%

It can be written as

= 5/2%

By further calculation

= 5/ (2 × 100)

= 1/40

(iii) 16 2/3 %

It can be written as

= 50/3 %

By further calculation

= 50/3 × 1/100

= 1/6

2. Express the following fractions as percentages:

(i) 3/2

(ii) 9/20

(iii) 1 ¼

Solution:

(i) 3/2

It can be written as

= 3/2 × 100%

= 150%

(ii) 9/20

It can be written as

= 9/20 × 100%

= 45%

(iii) 1 ¼

It can be written as

= 5/4 × 100%

= 125%

3. Express the following fractions as decimals. Then express the decimals as percentages:

(i) ¾

(ii) 5/8

(iii) 3/16

Solution:

(i) ¾ = 0.75

It can be written as

¾ = ¾ × 100%

By further calculation

= 3 × 25%

= 75%

(ii) 5/8 = 0.625

It can be written as

5/8 = 5/8 × 100%

By further calculation

= 5/2 × 25%

= 125/2%

= 62.5%

(iii) 3/16 = 0.1875

It can be written as

3/16 = 3/16 × 100%

By further calculation

= ¾ × 25%

= 75/4%

= 18.75%

4. Express the following fractions as decimals correct to four decimal places. Then express the decimals as percentages:

(i) 2/3

(ii) 5/6

(iii) 4/7

Solution:

(i) 2/3 = 0.6667

By correcting to four decimal places

2/3 = 0.6667 × 100% = 66.67%

(ii) 5/6 = 0.8333

By correcting to four decimal places

5/6 = 0.8333 × 100% = 83.33%

(iii) 4/7 = 0.5714

By correcting to four decimal places

4/7 = 0.5714 × 100% = 57.14%

5. Express the following ratios as percentages:

(i) 17 : 20

(ii) 13 : 18

(iii) 93: 80

Solution:

(i) 17: 20

It can be written as

17: 20 = 17/ 20

By further calculation

= 17/20 × 100%

So we get

= 17 × 5%

= 85%

(ii) 13: 18

It can be written as

13: 18 = 13/18

By further calculation

= 13/18 × 100%

So we get

= 13/9 × 50%

= 650/9 %

= 72 2/9%

(iii) 93: 80

It can be written as

93: 80 = 93/80

By further calculation

= 93/80 × 100%

So we get

= 93/4 × 5%

= 465/4%

= 116.25 %

6. Express the following percentages as decimals:

(i) 20%

(ii) 2%

(iii) 3 ¼ %

Solution:

(i) 20%

It can be written as

= 20/100

So we get

= 0.20

= 0.2

(ii) 2%

It can be written as

= 2/100

So we get

= 0.02

(iii) 3 ¼

It can be written as

= 13/4

Multiply the denominator by 100

= 13/ (4 × 100)

= 13/ 400

By further calculation

= 3.25/100

= 0.325

7. Find the value of:

(i) 27 % of ₹ 50

(ii) 6 ¼ % of 25 kg

Solution:

(i) 27 % of ₹ 50

It can be written as

= 27/100 of ₹50

By further calculation

= 27/100 × 50

So we get

= 27/2

= ₹ 13.50

(ii) 6 ¼ % of 25 kg

It can be written as

= 25/4% of 25 kg

By further calculation

= 25/ (4 × 100) of 25 kg

= (25 × 25)/ (4 × 100)

So we get

= 25/16

= 1 9/16 kg

8. What percent is:

(i) 300 g of 2 kg

(ii) ₹ 7.50 of ₹ 6

Solution:

(i) Required percentage = [300 gram/ 2 kg × 100] %

It can be written as

= [300 gram/ (2 × 1000 gram) × 100] %

By further calculation

= [300/ (2 × 1000) × 100] %

So we get

= (30/2) %

= 15 %

(ii) Required percentage = [₹ 7.50/ ₹ 6 × 100] %

It can be written as

= [7.50/ 6 × 100] %

By further calculation

= [7.50/3 × 50] %

So we get

= [2.50 × 50] %

= 125%

9. What percent of:

(i) 50 kg is 65 kg

(ii) ₹ 9 is ₹ 4

Solution:

(i) Consider x% of 50 kg as 65 kg

x% of 50 kg = 65 kg

It can be written as

x/ 100 × 50 = 65

By further calculation

x/ 2 = 65

By cross multiplication

x = 130

Therefore 130% of 50 kg is 65 kg.

(ii) Consider x% of ₹ 9 is ₹ 4

x% of ₹ 9 = ₹ 4

It can be written as

x/ 100 × 9 = 4

By further calculation

x = 4 × 100/9

So we get

x = 400/9

x = 44 4/9

Therefore, 44 4/9 % of ₹ 9 is ₹ 4.

10. (i) If 16 2/3 % of a number is 25, find the number.

(ii) If 13.25 % of a number is 159, find the number.

Solution:

(i) Consider the number as x

16 2/3 % of x = 25

By further calculation

50/3 % of x = 25

It can be written as

50/3 × 1/100 of x = 25

So we get

x = (25 × 3 × 100)/ 50

x = 150

Therefore, the number is 150.

(ii) Consider the number as x

13.25% of x = 159

It can be written as

13.25/ 100 of x = 159

By further calculation

x = (159 × 100)/ 13.25

Multiply and divide by 100

x = (159 × 100 × 100)/ 1325

So we get

x = (159 × 4 × 100)/ 53

x = 3 × 4 × 100

x = 1200

Therefore, the number is 1200.

11. (i) Increase the number 60 by 30 %

(ii) Decrease the number 750 by 10%

Solution:

(i) New number = (1 + 30/100) of 60

By further calculation

= (1 + 3/10) × 60

So we get

= 13/10 × 60

= 78

(ii) New number = (1 − 10/100) of 750

By further calculation

= (1 − 1/10) × 750

So we get

= 9/10 × 750

= 9 × 75

= 675

12. (i) What number when increased by 15% becomes 299?

(ii) On decreasing the number by 18%, it becomes 697. Find the number.

Solution:

(i) Consider the original number as x

Here

New number = (1 + 15/100) of original number

Substituting the values

299 = (1 + 3/20) × x

Taking LCM

299 = [(20 + 3)/ 20] × x

By further calculation

299 = 23/20 × x

So we get

x = (299 × 20)/ 23

x = 13 × 20

x = 260

Therefore, the original number is 260.

(ii) Consider the original number as x

Here

New number = (1 − 18/100) of original number

Substituting the values

697 = (1 − 18/100) of x

Taking LCM

697 = [(100 − 18)/ 100] × x

By further calculation

697 = 82/100 × x

So we get

x = (697 × 100)/ 82

x = (697 × 50)/ 41

By further simplification

x = 17 × 50

x = 850

Therefore, the original number is 850.

13. Mr. Khanna spent 83% of his salary and saved ₹ 1870. Calculate his monthly salary.

Solution:

It is given that

Mr. Khanna spent 83% of his salary

Savings = 100 − 83 = 17%

So 17% of his salary = ₹ 1870

We know that

His salary = ₹ (1870 × 100)/ 17

= ₹ 11000

14. In school, 38% of the students are girls. If the number of boys is 1023, find the total strength of the school.

Solution:

It is given that

No. of girls in school = 38%

No. of boys in school = (100 – 38) % = 62%

Consider x as the total strength of school

62% of x = 1023

It can be written as

62/100 × x = 1023

By further calculation

x = 1023 × 100/62

So we get

x = 1023 × 50/31

x = 33 × 50

x = 1650

Therefore, the total strength of the school is 1650.

15. The price of an article increases from ₹ 960 to ₹ 1080. Find the percentage increase in the price.

Solution:

It is given that

Increase in the price of an article = 1080 − 960 = ₹ 120

We know that

Percentage increase in the price = 120/960 × 100%

By further calculation

= 1/8 × 100%

So we get

= 100/8 %

= 25/2 %

= 12.5 %

16. In a straight contest, the loser polled 42% votes and lost by 14400 votes. Find the total number of votes polled. If the total number of eligible voters was 1 lakh, find what percentage of voters did not vote.

Solution:

It is given that

Losing candidate got 42% of the votes polled

Votes secured by winning candidate = (100 − 42) % of the votes polled

= 58 % of the votes polled

So the difference of votes = 58% − 42%

= 16% of the votes polled

We know that

16% of the votes polled = 14400

16%/100 of the votes polled = 14400

So the votes polled = 14400 × 100/16

By further calculation

= 900 × 100

= 90000

Here

Total number of eligible voters = 100000

No. of voters who did not vote = 100000 − 90000

= 10000

Percentage of voters did not vote = [10000/ 100000 × 100] %

By further calculation

= 10000/1000 %

= 10 %

17. Out of 8000 candidates, 60% were boys. If 80% of the boys and 90% of the girls passed the exam, find the number of candidates who failed.

Solution:

It is given that

Total number of candidates = 8000

No. of boys = 60% of 8000

By further calculation

= 60/100 × 8000

So we get

= 60 × 80

= 4800

No. of girls = 8000 − 4800 = 3200

No. of passed boys = 80% of No. of boys

It can be written as

= 80/100 × 4800

So we get

= 80 × 48

= 3840

No. of passed girls = 90% of No. of girls

It can be written as

= 90/100 × 3200

So we get

= 90 × 32

= 2880

No. of passed candidates = 3840 + 2880 = 6720

No. of failed candidates = 8000 − 6720 = 1280

Therefore, the number of candidates who failed is 1280.

18. In an exam, ¼ of the students failed both in English and Maths, 35% of the students failed in Maths and 30% failed in English.

(i) Find the percentage of students who failed in any of the subjects.

(ii) Find the percentage of students who passed in both subjects.

(iii) If the number of students who failed only in English was 25, find the total number of students.

Solution:

Consider the total number of students = x

No. of students who failed both in English and Maths = ¼ of x = x/4

No. of students who failed in Maths = 35% of x

It can be written as

= 35/100 of x

By further calculation

= 7/20 × x

= 7x/20

No. of students who failed in English = 30% of x

It can be written as

= 30/100 × x

By further calculation

= 3/10 × x

= 3x/10

(i) No. of students who failed in any of the subject = (7x/20 + 3x/10) − x/4

Taking LCM

= (7x + 6x)/ 20 − x/4

So we get

= (13x − 5x)/ 20

= 8x/20

Percentage of students who failed in any of the subject = 8x/20/x × 100%

We can write it as

= 8x/20 × 1/x × 100%

By further calculation

= 8 × 1 × 5%

= 40%

(ii) Percentage of students who passed in both the subjects = 100 − 40 = 60%

(iii) It is given that

No. of students who failed only in English = 25

We can write it as

$3x/10 − x/4 = 25$

No. of students who failed only in English = $3x/10 − x/4$

Taking LCM

$(6x − 5x)/ 20 = 25$

By further calculation

$x = 25 × 20$

$x = 500$

Therefore, the total number of students is 500.

19. On increasing the price of an article by 16%, it becomes ₹ 1479. What was its original price?

Solution:

Consider the original price of an article = ₹ x

$1479 = (1 + 16/100)$ of original price

It can be written as

$1479 = [(100 + 16)/ 100] × ₹ x$

By further calculation

$1479 = 116/100 \times x$

So we get

$116x/100 = 1479$

By separating the terms

$x = (1479 \times 100)/116$

$x = (1479 \times 25)/29$

By division

$x = 51 \times 25$

$x = 1275$

Therefore, the original price of an article is ₹ 1275.

20. Pratibha reduced her weight by 15%. If now she weighs 59.5 kg, what was her earlier weight?

Solution:

It is given that

Weight reduced by Pratibha = 15%

Present weight of Pratibha = 59.5 kg

Consider her original weight = 100

Reduced weight = 100 − 15 = 85%

Here

85% of her original weight = 59.5 kg

So her original weight = (59.5 × 100)/ 85

By further calculation

= 0.7 × 100

= 70 kg

21. In a sale, a shop reduces all its prices by 15%. Calculate:

(i) the cost of an article which was originally priced at ₹ 40.

(ii) the original price of an article which was sold for ₹ 20.40.

Solution:

It is given that
Rate of reduction = 15%

(i) Original price of an article = ₹ 40

Rate of reduction = 15%

By further calculation

Reduction = (40 × 15)/ 100 = ₹ 6

So the sale price = 40 − 6 = ₹ 34

(ii) Sale price = ₹ 20.40

Rate of reduction = 15%

We know that

Cost price = (SP × 100)/ (100 − reduction %)

Substituting the values

= (20.40 × 100)/ (100 − 15)

By further calculation

= (2040 × 100)/ (100 × 85)

= ₹ 24

22. Increase the price of ₹ 200 by 10% and then decrease the new price by 10%. Is the final price same as the original one?

Solution:

It is given that

Rate of increase = 10%

Rate of decrease = 10%

Price of article = ₹ 200

Here

Increased price = ₹ 200 × (100 + 10)/ 100

By further calculation

= ₹ 200 × 110/100

= ₹ 220

We know that

Decreased price = ₹ 200 × (100 − 10)/ 100

So we get

= ₹ 220 × 90/100

= ₹ 198

No, the final price is not as same as the original one.

23. Chandani purchased some parrots. 20% flew away and 5% died. Of the remaining, 45% were sold. Now 33 parrots remain. How many parrots had Chandani purchased?

Solution:

Consider Chandani purchased x parrots

No. of parrots flew away = 20% of x

It can be written as

= 20/100 × x

So we get

= 1/5 × x

= x/5

No. of parrots died = 5% of x

It can be written as

= 5/100 × x

= x/20

No. of parrots remaining = x − (x/5 + x/20)

Taking LCM

= x − [(4x + x)/ 20]

By further calculation

= x − 5x/20

= x − x/4

Taking LCM

= (4x − x)/ 4

= 3x/4

No. of sold parrots = 45% of 3x/4

It can be written as

= 45/100 × 3x/4

By further calculation

= 9/20 × 3x/4

= 27x/80

No. of parrots which are not sold = 3x/4 – 27/80

Taking LCM

= (60x – 27x)/ 80

= 33x/80

Based on the question

33x/80 = 33

By cross multiplication

33x = 33 × 80

So we get

x = (33 × 80)/ 33

x = 80

Therefore, Chandani purchased 80 parrots.

24. A candidate who gets 36% marks in an examination fails by 24 marks but another candidate, who gets 43% marks, gets 18 more marks than the minimum pass marks. Find the maximum marks and the percentage of pass marks.

Solution:

Consider x as the maximum marks

Marks secured by the first candidate = 36% of x

It can be written as

= 36/100 × x

= 36x/ 100

Marks secured by another candidate = 43% of x

It can be written as

= 43/100 × x

= 43x/ 100

The qualifying marks are same for both the candidates

So according to the question

36x/100 + 24 = 43x/100 − 18

By further calculation

24 + 18 = 43x/100 − 36x/ 100

Taking LCM

42 = (43x − 36x)/ 100

42 = 7x/100

By cross multiplication

x = 42 × 100/7

x = 6 × 100

x = 600

Here the maximum marks = 600

Marks secured by first candidate = 36/100 × 600 = 36 × 6 = 216

Qualifying marks = 216 + 24 = 240

So the percentage of qualifying marks = (240/600 × 100) %

By further calculation

= 240/6 %

= 40 %

Hence, the maximum mark is 600 and the percentage of pass marks is 40%.