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SUB TOPIC: PERCENT CHANGE

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 8
CHAPTER NAME : PERCENT AND PERCENTAGE

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LEARNING OUTCOME

- Students will be able to
- **Express a quantity as a percent of the other.**
- **Increase a number by percent.**
- **Calculate increase or decrease in % of a quantity.**

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PREVIOUS CONNECT

28%/ of a number is 84. Find the number?

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To calculate the percentage increase/ decrease:

1.First: work out the difference (increase/decrease) between the two numbers you are comparing.

2.Increase/ Decrease = New Number - Original Number.

3.Then: divide the increase /Decrease by the original number and multiply the answer by 100.

4.% increase/decrease = Increase/decrease ÷ Original Number × 100

EVALUATION QUESTIONS

1. 28% of a number is 84. Find the number.

Solution:

Consider x as the number

28% of x = 84

We can write it as

28/100 × x = 84

By further calculation

28x = 84 × 100

So we get

x = 300

2. Every month, a man spends 72% of his income and saves ₹ 12,600.
Find:
(i) his monthly income
(ii) his monthly expenses
Solution:
Consider ₹ x as the total salary of the man
Amount spent by man = 72/100 × x
Amount saved by man = ₹ 12,600
(i) His monthly income
x = 72/100 x + 12600
By further calculation
x = (72x + 1260000)/ 100
So we get
100x – 72x = 1260000
28x = 1260000
Here
x = 1260000/28
x = 45000

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(ii) His monthly expenses = 72/100 × 45000

So we get

= 72 × 450

= ₹ 32, 400

4. 6 ¼ % of a weight is 0.25 kg. What is 45% of this weight?

Solution:

Consider x kg as the required weight

6 ¼/100 × x = 0.25

We can write it as

25/4 × 1/100 × x = 25/100

By further calculation

25x = 25 × 4 = 100

x = 100/25 = 4 kg

So 45% of this weight = 45/100 × 4 = 4/5 = 1.8 kg

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5. An alloy consists of 13 parts of copper, 7 parts of zinc and 5 parts of nickel. Find the percentage of copper in the alloy.

Solution:

Here the sum of all parts = 13 + 7 + 5 = 25

Percentage of copper = 13/25 × 100 = 52%

Percentage of zinc = 7/25 × 100 = 28%

Percentage of nickel = 5/25 × 100 = 20%

8. Find the number which when decreased by 15% becomes 1360.

Solution:

Consider x as the required number

$x - (15/100 \times x) = 1360$

By further calculation

$x - 3x/20 = 1360$

Taking LCM

$(20x - 3x)/ 20 = 1360$

So we get

$17x = 1360 \times 20$

$x = (1360 \times 20)/ 17 = 1600$

10. Actual length of a rope is 22.5 m but it is wrongly measured as 21.6 m. Find the percentage error.

Solution:

Error measured = 22.5 – 21.6 = 0.9 m

So the percentage of error = 9/10 × 1/22.5 × 100

We get

= 9/10 × 10/225 × 100

= 4%

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3. Decrease:

(i) 80 by 20%

(ii) 300 by10%

(iii) 50 by 12.5%

Solution:

(i) 80 by 20%

Decrease on 80 by 20% = 80 × 20/100 = 16

So the decreased number = 80 – 16 = 64

(ii) 300 by10%

Decrease on 300 by 10% = 300 × 10/100 = 30

So the decreased number = 300 – 30 = 270

(iii) 50 by 12.5%

Decrease on 50 by 12.5% = 50 × 12.5/100

We can write it as

= (50 × 125)/ (10 × 100)

= 25/4

= 6.25%

So the decreased number = 50 – 6.25 = 43.75

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4. What number:

(iv) when decreased by 40% becomes 480?

(v) when increased by 100% becomes 100?

(vi) when decreased by 50% becomes 50?

(iv) Consider 100 as the number
So the decrease = 40% = 40
Decreased number = 100 – 40 = 60
If the decreased number is 60 then the original number = 100
If the decreased number is 480 then the original number =
(100 × 480)/ 60 = 800

(v) Consider 100 as the number
So the increase = 100% = 100
Increased number = 100 + 100 = 200
If the increased number is 200 then the original number = 100
If the increased number is 100 then the original number =
(100 × 100)/ 200 = 50

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vi) Consider 100 as the number

So the decrease = 50% = 50

Decreased number = 100 – 50 = 50

If the decreased number is 50 then the original number = 100

If the decreased number is 50 then the original number = (100 × 50)/ 50 = 100

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6. If the price of an article is increased by 25%, the increase is ₹ 10. Find the new price.

Solution:

Consider ₹ 100 as the price of an article

The price of the article is increased = 25% = ₹ 25

So the increased price = 100 + 25 = ₹ 125

If the increase in the price is ₹ 25 then the new price = ₹ 125

If the increase in the price is ₹ 10 then the new price = (125 × 10)/ 25 = ₹ 50

8. The price of a chair is reduced by 25%. What is the ratio of:
(i) change in price to the old price.
(ii) old price to the new price.

Solution:

Consider ₹ 100 as the original price of the chair
The price of the chair is reduced = 25% = ₹ 25
So the reduced price = 100 – 25 = ₹ 75
(i) Ratio of change in price to the old price = 25: 100
Dividing by 25
= 1: 4
(ii) Ratio of old price to the new price = 100: 75
Dividing by 25
= 4: 3

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9. If x is 20% less than y, find:

(i) x/y

(ii) y – x/ y

(iii) x/ y – x

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Solution:

Consider y = 100

Reduction = 20% = 20

x = 100 – 20 = 80

(i) x/ y = 80/ 100

Dividing by 20

= 4/5

(ii) (y – x)/ y = (100 – 80)/ 100

So we get

= 20/100

Dividing by 20

= 1/5

(iii) x/ (y – x) = 80/ (100 – 80)

So we get

= 80/20

Dividing by 20

= 4 /1

= 4

11. The weight of a machine is 40 kg. By mistake, it was weighed as 40.8 kg. Find the error percent.

Solution:

Weight of the machine = 40 kg

Error weight of the machine = 40.8 kg

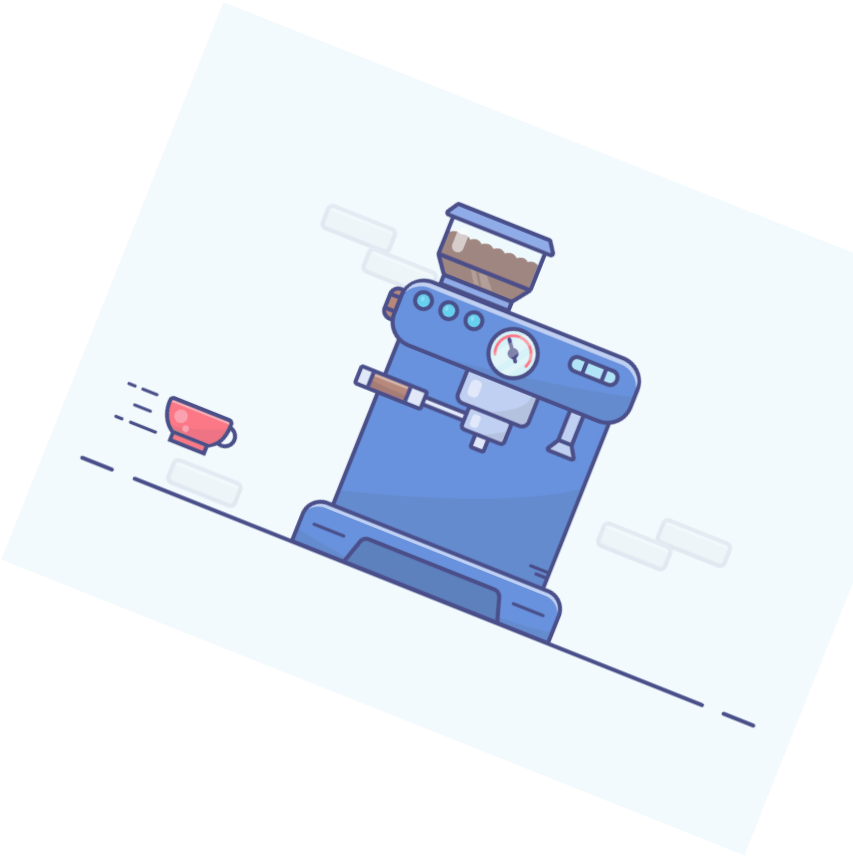
Error in weight = 40.8 – 40 = 0.8 kg

So the error percent = (0.8 × 100)/ 40

We can write it as

= (8 × 100)/ (10 × 40)

= 2%



12. From a can, containing 450 litres of petrol, 8% of the petrol was lost by leakage and evaporation. How many litres of petrol were left in the cask?

Solution:

Petrol in the cask = 450 litres

Petrol lost by leakage and evaporation = 8%

So the petrol lost = 8% of 450 litres

We can write it as

$= (8 \times 450)/ 100$

= 36 litres

Petrol left in the cask = 450 – 36 = 414 litres

14. In an examination, first division marks are 60%. A student secures 538 marks and misses the first division by 2 marks. Find the total marks of the examination.

Solution:

Marks for first division = 60%

A student gets 530 marks and misses the first division by 2 marks

Marks for first division = 538 + 2 = 540

60% of total marks = 540

We can write it as

60/100 × total marks = 540

So we get

Total marks = (540 × 100)/ 60 = 900

15. Out of 1200 pupils in a school, 900 are boys and the rest are girls. If 20% of the boys and 30% of the girls wear spectacles, find:
(i) how many pupils in all wear spectacles.
(ii) what percent of the total number of pupils wear spectacles.

Solution:

Number of pupils = 1200

Number of boys = 900

Number of girls = 1200 – 900 = 300

Number of boys who wear spectacles = 20% of 900

We can write it as

= 20/100 × 900

= 180

Number of girls who wear spectacles = 30% of 300

We can write it as

= 30/100 × 300

= 90

(i) Number of pupils in all wear spectacles = 180 + 90 = 270

(ii) Percent of the total number of pupils wear spectacles = (270 × 100)/ 1200

So we get

= 270/12

= 22.5%

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HOME ASSIGNMENT

- EX8 D

THANKING YOU

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