EXERCISE 12(A)

1. In each of the following, check whether or not the given ratios form a proportion:
(i) 8: 16 and 12: 15
(ii) 16: 28 and 24: 42
(iii) 12 ÷ 3 and 8 ÷ 2
(iv) 25: 40 and 20: 32
(v) 15 / 18 and 10 / 12
Solution:
(i) 8: 16 and 12: 15
The above expression can be written as follows:
8: 16 = 8 / 16
= 1 / 2 and
12: 15 = 12 / 15
= 4 / 5
Since 8: 16 ≠ 12: 15
Therefore they are not in proportion
(ii) 16: 28 and 24: 42
The above expression can be written as follows:
16: 28 = 16 / 28
= 4 / 7 and
24: 42 = 24 / 42
= 4 / 7
Since 16: 28 = 24: 42
Therefore they form a proportion
(iii) 12 ÷ 3 and 8 ÷ 2
The above expression can be written as follows:
12 ÷ 3 = 12 / 3
= 4 and
8 ÷ 2 = 8 / 2
= 4
Since 12: 3 = 8: 2
Therefore they form a proportion
(iv) 25: 40 and 20: 32
The above expression can be written as follows:
25: 40 = 25 / 40
= 5 / 8 and
20: 32 = 20 / 32
= 5 / 8
Since 25: 40 = 20: 32

Therefore they form a proportion
(v) 15 / 18 and 10 / 12
15 / 18 = 5 / 6 and
10 / 12 = 5 / 6
Since 15 / 18 = 10 / 12
Therefore they form a proportion

2. Find the value of x in each of the following proportions:
(i) x: 4 = 6: 8
(ii) 14: x = 7: 9
(iii) 4: 6 = x: 18
(iv) 8: 10 = x: 25
(v) 5: 15 = 4: x
Solution:
(i) x: 4 = 6: 8
The given proportion can be calculated for the value of x as follows:
x: 4 = 6: 8
x / 4 = 6 / 8
$\Rightarrow$ x × 8 = 4 × 6
$\Rightarrow$ x = (4 × 6) / 8
$\Rightarrow$ x = 3
Therefore the value of x is 3
(ii) 14: x = 7: 9
The given proportion can be calculated for the value of x as follows:
14: x = 7: 9
14 / x = 7 / 9
$\Rightarrow$ x × 7 = 14 × 9
$\Rightarrow$ x = (14 × 9) / 7
$\Rightarrow$ x = 18
Therefore the value of x is 18
(iii) 4: 6 = x: 18
The given proportion can be calculated for the value of x as follows:
4 / 6 = x / 18
$\Rightarrow$ x × 6 = 4 × 18
$\Rightarrow$ x = (4 × 18) / 6
$\Rightarrow$ x = 12
Therefore the value of x is 12
(iv) 8: 10 = x: 25
The given proportion can be calculated for the value of x as follows:

8 / 10 = x / 25

⇒ 10 × x = 25 × 8

⇒ x = (25 × 8) / 10

⇒ x = 20

Therefore the value of x is 20

(v) 5: 15 = 4: x

The given proportion can be calculated for the value of x as follows:

5 / 15 = 4 / x

⇒ 5 × x = 15 × 4

⇒ x = (15 × 4) / 5

⇒ x = 12

Therefore the value of x is 12

3. Find the value of x so that the given four numbers are in proportion:

(i) x, 6, 10 and 15

(ii) x, 4, 15 and 30

(iii) 2, x, 10 and 25

(iv) 4, x, 6 and 18

(v) 9, 12, x and 8

Solution:

(i) x, 6, 10 and 15

The given proportion can be calculated for the value of x as follows:

x: 6: 10: 15

⇒ x ×15 = 6 × 10

⇒ x = (6 × 10) / 15

⇒ x = 60 / 15

⇒ x = 4

Therefore the value of x is 4

(ii) x, 4, 15 and 30

The given proportion can be calculated for the value of x as follows:

x: 4: 15: 30

⇒ x × 30 = 4 × 15

⇒ x = (4 × 15) / 30

⇒ x = 60 / 30

⇒ x = 2

Therefore the value of x is 2

(iii) 2, x, 10 and 25

The given proportion can be calculated for the value of x as follows:

2: x: 10: 25

⇒ x × 10 = 2 × 25
⇒ x = (2 × 25) / 10
⇒ x = 50 / 10
⇒ x = 5
Therefore the value of x is 5
(iv) 4, x, 6 and 18
The given proportion can be calculated for the value of x as follows:
4: x: 6: 18
⇒ x × 6 = 18 × 4
⇒ x = (18 × 4) / 6
⇒ x= 72 / 6
⇒ x = 12
Therefore the value of x is 12
(v) 9, 12, x and 8
The given proportion can be calculated for the value of x as follows:
9: 12: x: 8
⇒ 12 × x = 9 × 8
⇒ x = (9 × 8) / 12
⇒ x = 72 / 12
⇒ x = 6
Therefore the value of x is 6

**4. The first, second and the fourth terms of a proportion are 6, 18 and 75,
respectively. Find its third term**
Solution:
Given
First term = 6
Second term = 18
Fourth term = 75
Third term =?
Let the third term be x
6: 18: x: 75
⇒ x × 18 = 6 × 75
⇒ x = (6 × 75) / 18
⇒ x = 25
Therefore the value of third term is 25

**5. Find the second term of the proportion whose first, third and fourth terms are 9,
8 and 24 respectively.**

Solution:
Given
First term = 9
Third term = 8
Fourth term = 24
Second term =?
Let the second term be x
9: x: 8: 24
⇒ x × 8 = 9 × 24
⇒ x = (9 × 24) / 8
⇒ x = 216 / 8
⇒ x = 27
Therefore the value of x is 27

6. Find the fourth term of the proportion whose first, second and third terms are 18, 27 and 32 respectively.
Solution:
Given
First term = 18
Second term = 27
Third term = 32
Fourth term =?
Let the fourth term be x
18: 27: 32: x
⇒ x × 18 = 32 × 27
⇒ x = (32 × 27) / 18
⇒ x = 48
Therefore the value of x is 48

7. The ratio of the length and the width of a school ground is 5: 2. Find the length, if the width is 40 metres.
Solution:
Given
The ratio of the length and the width of a school ground = 5: 2
The width of the school ground = 40 metre
Let the length of the school ground be x metre
Hence the length of the ground can be calculated as follows:
Ratio of length to width of a school ground = x: 40
According to the given statement

5: 2 = x: 40

⇒ 2 × x = 40 × 5

⇒ x = (40 × 5) / 2

⇒ x = 200 / 2

⇒ x = 100 m

Therefore the length of the school ground is 100 m

8. The ratio of the sale of eggs on a Sunday and that of the whole week at a grocery shop was 2: 9. If the total value of the sale of eggs in the same week was Rs 360, find the value of the sale of eggs that Sunday.

Solution:

Given

Ratio of sale of eggs on a Sunday and whole week at a grocery shop = 2: 9

Total sale of eggs in the same week = Rs 360

Let the sale of eggs on Sunday be x

Hence the sale of eggs on Sunday can be calculated as follows:

2: 9 = x: 360

⇒ 9 × x = 360 × 2

⇒ x = (360 × 2) / 9

⇒ x = 720 / 9

⇒ x = 80

Therefore the value of the sale of eggs on Sunday is of Rs 80

9. The ratio of copper and zinc in an alloy is 9: 8. If the weight of zinc, in the alloy, is 9.6 kg, find the weight of copper in the alloy.

Solution:

Given

Ratio of copper and zinc in an alloy = 9: 8

Weight of zinc in an alloy = 9.6 kg

Let x kg be the weight of copper in the alloy

Hence the weight of copper can be calculated as below

9: 8 = x: 9.6

⇒ 8 × x = 9 × 9.6

⇒ x = (9 × 9. 6) / 8

⇒ x = 86.4 / 8

⇒ x = 10.8

Therefore the weight of copper in the alloy is 10.8 kg

10. The ratio of the number of girls to the number of boys in a school is 2: 5. If the

number of boys is 225; find:
(i) the number of girls in the school
(ii) the number of students in the school.
Solution:
Given
Ratio of girls to the boys in a school = 2.5
Number of boys in a school = 225
(i) Let x be the number of girls in a school
Hence number of girls in a school can be calculated as follows:
2: 5 = x: 225
⇒ 5 × x = 2 × 225
⇒ x = (2 × 225) / 5
⇒ x = 450 / 5
⇒ x = 90
Therefore the number of girls in the school is 90
(ii) Total number of students in a school becomes
Total student = Total boys + Total girls
= 225 + 90
= 315
Therefore total number of students in the school is 315

**11. In a class 1 out of every 5 students pass. If there are 225 students in all the
sections of a class, find how many pass?**
Solution:
Given
Total number of students in all the sections of a class = 225
And 1 out of every 5 students pass
So, total number of pass students can be calculated as follows:
Total student pass = 225 × 1 / 5
= 45
Therefore total pass students are 45

12.Make set of all possible proportions from the numbers 15, 18, 35 and 42
Solution:
Given
Numbers are 15, 18, 35 and 42
Hence the possible proportions are as follows:
(i) 15: 18:: 35: 42
(ii) 15: 35:: 18: 42

(iii) 42: 18:: 35: 15
(iv) 42: 35:: 18: 15