EXERCISE 11(A)

1. Express each of the following ratios in its simplest form
(a) (i) 4: 6
(ii) 48: 54
(iii) 200: 250
(b) (i) 5 kg: 800 gm
(ii) 30 cm: 2 m
(iii) 3m: 90 cm
(iv) 2 years: 9 months
(v) 1 hour: 45 minutes
(c) (i) $1\frac{1}{2} : 2\frac{1}{2}$
(ii) $3\frac{1}{2} : 7$
(iii) $2\frac{1}{3} : 3\frac{1}{2} : 1\frac{1}{4}$
(iv) x²: 4x
(v) 2.5: 1.5
Solution:
(a) (i) Given ratio
4: 6
This can be written as
4 / 6
= 2 / 3
= 2: 3
Hence, 2: 3 is the simplest form of 4: 6
(ii) Given
48: 54
This can be written as
48 / 54
= 8 / 9
= 8: 9
Hence, 8: 9 is the simplest form of 48: 54
(iii) Given
200: 250
This can be written as
200 / 250
= 4 / 5
= 4: 5
Hence, 4: 5 is the simplest form of 200: 250

(b) (i) Given

5 kg: 800 gm

5 kg = 5 × 1000 gm = 5000 gm

[∵ 1 kg = 1000 gm]

This can be written as

5000 gm / 800 gm

= 25 gm / 4 gm

= 25 gm: 4 gm

Hence, 25 gm: 4 gm is the simplest form of 5 kg: 800 gm

(ii) 30 cm: 2 m

We know that, 1 m = 100 cm

2 m = 2 × 100 cm

= 200 cm

Given

30 cm: 2 m

This can be written as

30 cm / 200 cm

= 3 cm / 20 cm

= 3 cm: 20 cm

Hence, 3 cm: 20 cm is the simplest form of 30 cm: 2 m

(iii) 3 m: 90 cm

We know that, 1 m = 100 cm

3 m = 3 × 100 cm

= 300 cm

Given

3 m: 90 cm

This can be written as

300 cm / 90 cm

= 10 cm / 3 cm

= 10 cm: 3 cm

Hence, 10 cm: 3 cm is the simplest form of 3 m: 90 cm

(iv) 2 years: 9 months

We know that, 1 year = 12 months

2 years = 2 × 12 months

= 24 months

Given

2 years: 9 months

This can be written as

24 months / 9 months

= 8 months / 3 months

= 8 months: 3 months

Hence, 8 months: 3 months is the simplest form of 2 years: 9 months

(v) 1 hour: 45 minutes

We know that, 1 hour = 60 minutes

Given

1 hour: 45 minutes

This can be written as

60 minutes / 45 minutes

= 4 minutes / 3 minutes

= 4 minutes: 3 minutes

Hence, 4 minutes: 3 minutes is the simplest form of 1 hour: 45 minutes

(c) (i) $1\dfrac{1}{2} : 2\dfrac{1}{2}$

This can be written as

3 / 2: 5 / 2

By further calculation, we get

3 / 2 × 2 / 5

= 3 / 5

= 3: 5

Hence, the simplest form of $1\dfrac{1}{2} : 2\dfrac{1}{2}$ is 3: 5

(ii) $3\dfrac{1}{2} : 7$

This can be written as

7 / 2: 7 / 1

On further calculation, we get

7 / 2 × 1 / 7

= 1 / 2

= 1: 2

Hence, the simplest form of $3\dfrac{1}{2} : 7$ is 1: 2

(iii) $2\dfrac{1}{3} : 3\dfrac{1}{2} : 1\dfrac{1}{4}$

This can be written as

7 / 3: 7 / 2: 5 / 4

Now, taking L.C.M of 3, 2 and 4 we get

7 / 3 × 12: 7 / 2 × 12: 5 / 4 × 12

= 28: 42: 15

Hence, the simplest form of $2\dfrac{1}{3} : 3\dfrac{1}{2} : 1\dfrac{1}{4}$ is 28: 42: 15

(iv) x^2: 4x

This can be written as

x^2 / 4x

$= (x \times x) / (4 \times x)$

$= x / 4$

$= x$: 4

Hence, the simplest form of x^2: 4x is x: 4

(v) 2.5: 1.5

This can be written as

25 / 10: 15 / 10

On further calculation, we get

$= 25 / 10 \times 10 / 15$

$= 25 / 15$

$= 5 / 3$

$= 5$: 3

Hence, the simplest form of 2.5: 1.5 is 5: 3

2. A field is 80 m long and 60 m wide. Find the ratio of its width to its length.
Solution:
Given
Width of the field = 60 m
Length of the field = 80 m
Ratio of its width to its length = 60: 80
On further simplification, we get
= 60 / 80
= 3 / 4
= 3: 4
Hence, the ratio of its width to its length is 3: 4

3. State, true or false:
(i) A ratio equivalent to 7: 9 is 27: 21
(ii) A ratio equivalent to 5: 4 is 240: 192
(iii) A ratio of 250 gm and 3 kg is 1: 12
Solution:
(i) False
Correct statement: A ratio equivalent to 7: 9 is 9: 7
(ii) True
(iii) True

4. Is the ratio of 15 kg and 35 kg same as the ratio of 6 years and 14 years?

Solution:
Ratio of 15 kg and 35 kg = 15 kg: 35 kg
We get
15 kg / 35 kg
On simplification, we get
= 3 kg / 7 kg
= 3: 7
Now, the ratio of 6 years and 14 years = 6 years: 14 years
We get
6 years / 14 years
On simplification, we get
= 3 years / 7 years
= 3: 7
Since both the ratios = 3: 7
Hence, the ratios are same in both the cases

5. Is the ratio of 6 g and 15 g same as the ratio of 36 cm and 90 cm?
Solution:
Ratio of 6 g and 15 g = 6 g: 15 g
On calculating further, we get
= 6 / 15
= 2 / 5
= 2: 5
Now, the ratio of 36 cm and 90 cm = 36cm: 90 cm
By calculating further, we get
= 36 / 90
= 18 / 45
= 6 / 15
= 2 / 5
= 2: 5
Since both the ratios = 2: 5
Hence, the ratios are same in both the cases

6. Find the ratio between 3.5 m, 475 cm and 2.8 m
Solution:
Given
3.5 m, 475 cm and 2.8 m
Now, convert all the values into cm
1 m = 100 cm
Hence,

3.5 × 100 = 350 cm
2.8 × 100 = 280 cm
Hence,
350 cm: 475 cm: 280 cm
The H.C.F. of 350, 475 and 280 is 5
So, the ratio will be
350 / 5: 475 / 5: 280 / 5
= 70: 95: 56
Therefore, the ratio between 3.5 m, 475 cm and 2.8 m is 70: 95: 56

7. Find the ratio between 5 dozen and 2 scores. [1 score = 20]
Solution:
Given
5 dozens and 2 scores
We know that,
1 dozen = 12 and 1 score = 20
Hence,
5 dozens = 12 × 5
= 60
2 scores = 2 × 20
= 40
So, the ratio will be
60: 40 = 60 / 40
= 3 / 2
= 3: 2
Hence, the ratio between 5 dozens and 2 scores is 3: 2