

## Ratio

Ratio is a comparison of two like quantities.

Ratio of two numbers a and b is written as ratio a to b,  $a : b$  or  $\frac{a}{b}$ .

### Example



Here number of squares = 5

Number of triangles = 2

Ratio of number of triangles to the number of squares is 2 : 5 or we can write  $\frac{2}{5}$ .

### Worksheet 10.1

- 1 What is the ratio of number of squares to the number of triangles?



:  or

- 2 What is the ratio of circles to the triangles?



:  or

- 3 What is the ratio of rectangles to the squares?



:  or

- 4 What is the ratio of circles to the squares?



:  or

- 5 What is the ratio of stars to the squares.



:  or

## Write a ratio

**Example** In a class of 40 students, 17 are boys and 23 are girls. The ratio of boys to girls is 17 to 23 or  $17 : 23$ .

The ratio of girls to the total numbers of students is  $\frac{23}{40}$  or  $23 : 40$ .

### Work sheet 10.2Work

1 In a box, there are 5 pens and 2 pencils. What is the ratio of pens to the pencils?

\_\_\_\_\_

3 A fruit seller sells 12 bananas and 5 apples to a customer. What is the ratio of bananas to the apples?

\_\_\_\_\_

5 Victor got 53 marks in Maths and 47 marks in English. What is the ratio of marks of Maths to the marks of English?

\_\_\_\_\_

7 Bobby has 4 chocolates and Dennis has 9 chocolates. What is the ratio of chocolates that Bobby is having to the chocolates that Dennis is having?

\_\_\_\_\_

2 In a zoo, there are 65 rabbits and 123 birds. What is the ratio of rabbits to the birds?

\_\_\_\_\_

4 In a school play, 15 girls and 19 boys are taking part. What is the ratio of boys who are taking part in the play to the total number of participants of the play?

\_\_\_\_\_

6 In a factory, 213 labourers are working, out of which 154 are males. Find the ratio of the female labourers to the total number of labourers?

\_\_\_\_\_

8 In a test of 50 questions, a student did 42 questions correct. What is the ratio of incorrect questions to the correct questions?

\_\_\_\_\_

## Equivalent ratios

When both the terms of a ratio (numerator and denominator) are multiplied or divided by the same non-zero number, equivalent ratios are obtained.

**Example**  $\frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$

10 : 15 is an equivalent ratio of 2 : 3.

**Example**  $\frac{12}{30} = \frac{12 \div 6}{30 \div 6} = \frac{2}{5}$

$\frac{12}{30}$  and  $\frac{2}{5}$  are equivalent ratios.

**Example** Are 6 : 15 and 4 : 3 equivalent ratios ?  
Make the numerator or denominator same and then compare the ratios.

$$\frac{4}{3} = \frac{4 \times 5}{3 \times 5} = \frac{20}{15}$$

As  $\frac{6}{15}$  and  $\frac{20}{15}$  are not equal therefore  
6 : 15 and 4 : 3 are not equivalent ratios.

### Work sheet 10.3

- 1 Is 25 : 15 equivalent to 5 : 3? \_\_\_\_\_
- 2 Is 7 : 14 equivalent to 21 : 42? \_\_\_\_\_
- 3 Is 9 : 18 equivalent to 18 : 16? \_\_\_\_\_
- 4 Is 5 : 6 equivalent to 25 : 30? \_\_\_\_\_
- 5 Is 48 : 90 equivalent to 24 : 45? \_\_\_\_\_
- 6 Is 36 : 72 equivalent to 18 : 53? \_\_\_\_\_
- 7 Is 150 : 81 equivalent to 300 : 160? \_\_\_\_\_
- 8 Is 64 : 40 equivalent to 8 : 5? \_\_\_\_\_
- 9 Is 100 : 75 equivalent to 20 : 15? \_\_\_\_\_
- 10 Is 56 : 42 equivalent to 8 : 7? \_\_\_\_\_

# Write equivalent ratios

**Example**  $\frac{8}{20} = \frac{2}{\square}$ , Find the missing number.

On dividing 8 by 4 we will get 2.

Therefore, we will divide both, numerator and denominator by 4.

$$\frac{8 \div 4}{20 \div 4} = \frac{2}{5}$$

Now  $\frac{2}{5}$  and  $\frac{8}{20}$  are equivalent ratios. So the missing number is 5.

## Work sheet 10.4

Find the missing number so that the ratios are equivalent.

1  $15 : 10 = \square : 2$

2  $20 : 80 = \square : 4$

3  $16 : 36 = 64 : \square$

4  $65 : 85 = 13 : \square$

5  $120 : 75 = 40 : \square$

6  $650 : 500 = \square : 10$

7  $88 : 121 = 880 : \square$

8  $35 : 50 = \square : 10$

Find the missing number and write an equivalent ratio for each of the given ratio.

9  $8 : 30 = 40 : \square = \underline{\hspace{2cm}}$

10  $14 : 50 = 56 : \square = \underline{\hspace{2cm}}$

11  $30 : 33 = \square : 198 = \underline{\hspace{2cm}}$

12  $105 : 150 = 7 : \square = \underline{\hspace{2cm}}$

13  $28 : 52 = \square : 104 = \underline{\hspace{2cm}}$

14  $93 : 102 = 31 : \square = \underline{\hspace{2cm}}$

15  $75 : 150 = 3 : \square = \underline{\hspace{2cm}}$

16  $200 : 150 = 4 : \square = \underline{\hspace{2cm}}$

## Ratio tables

**Example** Complete the ratio table.

4			
11			

In the table, the ratio is 4:11.

Multiply numerator and denominator by the same number to complete the table.

4	4×2	4×3	4×4	→	4	8	12	16
11	11×2	11×3	11×4		11	22	33	44

### Work sheet 10.5

Complete the ratio tables.

1

7	14	21	
3			12

2

4				20
9	18	27	36	

3

25	5	125		
30			90	210

4

16		64	32	
26	13			130

5

100			400	600
150	30	15		

6

12	2	8		
30			10	40

## Identify equivalent ratios

When two ratios are equal, they are said to be in a proportion. It is shown as

$$\frac{a}{b} = \frac{c}{d} \text{ or } a : b = c : d$$

First (a) and fourth (d) terms are said to be extreme terms. Second (b) and third (c) terms are said to be middle terms or means.

When ratios are in proportion, then the product of means is equal to the product of extremes. i.e.  $ad = bc$ .

**Example**  $\frac{3}{15} = \frac{6}{30}$

$$3 \times 30 = 90, 15 \times 6 = 90$$

Product of means is equal to the product of extremes.

Therefore, ratios are in proportion.

**Example** Check whether ratios are equivalent.

13 boys : 39 girls

18 boys : 54 girls

Ratios are  $\frac{13}{39}$  and  $\frac{18}{54}$

Do cross multiplication,  $\frac{13}{39} \times \frac{18}{54}$

$$13 \times 54 = 702, 18 \times 39 = 702$$

Cross products are equal, therefore ratios are equivalent.

**Example** Check whether ratios are equivalent.

20 males : 35 females

4 males : 8 females

Ratios are  $\frac{20}{35}$  and  $\frac{4}{8}$

$$20 \times 8 = 160, 35 \times 4 = 140$$

Ratios are not equivalent as cross products are not equal.

### Work sheet 10.6

Find whether the following ratios are equivalent or not.

- |   |  |    |   |
|---|--|----|---|
| 1 | 16 pens : 10 pencils<br>8 pens : 5 pencils _____                   | 2  | \$12 : 3 Chocolates<br>\$36 : 9 Chocolates _____          |
| 3 | 20 girls : 30 boys<br>4 girls : 6 boys _____                       | 4  | 15 parrots : 27 pigeons<br>5 parrots : 8 pigeons _____    |
| 5 | 40 males : 60 females<br>10 males : 10 females _____               | 6  | 30 days : 5 holidays<br>120 days : 10 holidays _____      |
| 7 | 5 persons : 2 kg fruits<br>15 persons : 4 kg fruits _____          | 8  | 150 children : 400 toys<br>900 children : 2000 toys _____ |
| 9 | 8 hospitals : 3000 patients<br>24 hospitals : 10000 patients _____ | 10 | 20 hens : 140 eggs<br>5 hens : 35 eggs _____              |

## Unit rates

Rate is a comparison of two different quantities. It is a special ratio in which units of two quantities are different.

A unit rate is a rate in which denominator is 1.

To find the unit rate, make the denominator 1.

**Example** A car is driven for 450 miles on 15 gallons. How much is driven on 1 gallon?

$$\frac{450 \text{ miles}}{15 \text{ gallons}}$$

Denominator will become 1 if we divide it by 15.

Divide both numerator and denominator by 15.

$$\frac{450 \div 15}{15 \div 15} = \frac{30}{1}$$

In 1 gallon, car is driven for 30 miles. It can be written as 30 miles per gallon.

In this case, unit rate is 30 miles per gallon. It means in 1 gallon the car is driven for 30 miles.

### Work sheet 10.7

Fill in the blanks.

- 1 60 pages in 3 chapters = \_\_\_\_\_ pages per chapter.
- 2 8 drawings in 2 days = \_\_\_\_\_ drawings per day.
- 3 40 chocolates for 20 children = \_\_\_\_\_ chocolates per children.
- 4 45 flowers on 5 plants = \_\_\_\_\_ flowers per plant.
- 5 60 teachers for 1,800 students = \_\_\_\_\_ students per teacher

# Equivalent rates

**Example** 46 students in 2 classes = 69 students in  classes.

In some cases, first unit rate need to be find out.

$$\frac{46}{2} = \frac{46 \div 2}{2 \div 2} = \frac{23}{1}$$

Unit rate is 23. Now multiply 23 by a number to get 69. If we multiply 23 by 3, we will get

69. Now multiply both numerator and denominator by 3.

$$\frac{23 \times 3}{1 \times 3} = \frac{69}{3}$$

46 students in 2 classes = 69 students in  class.

## Work sheet 10.8

### Fill in the blanks.

- 1 5 plants in a house = \_\_\_\_\_ plants in 6 houses
- 2 4l water in 4 bottles = \_\_\_\_\_ l water in 20 bottles
- 3 24 km covered in 20 minutes = 72 km covered in \_\_\_\_\_ minutes
- 4 3 kg fruits in a basket = \_\_\_\_\_ kg fruits in 20 baskets
- 5 25 students in a bus = \_\_\_\_\_ students in 20 buses
- 6 \$ 8000 earning in 5 months = \_\_\_\_\_ earning in 4 months
- 7 360 minutes in 6 hours = 180 minutes in \_\_\_\_\_ hours



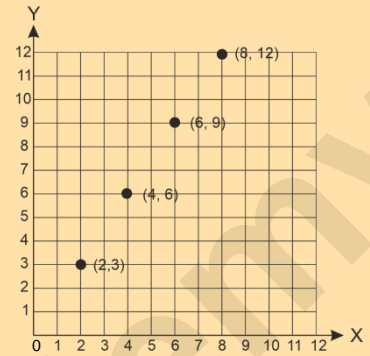
## Complete ratio tables and make a graph

**Example** Complete the table and graph the data by using the table.

x	2	4	6	8
y	3			12

Complete the table by finding equivalent ratios.

x	2	4	6	8
y	3	6	9	12

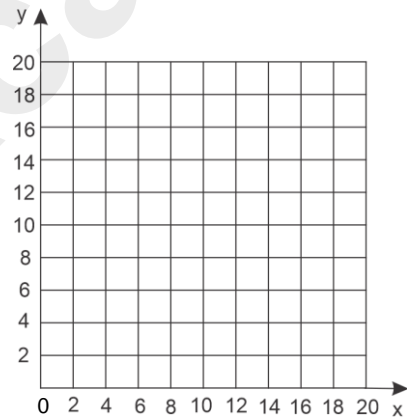


### Work sheet 10.9

Complete the table and graph the data.

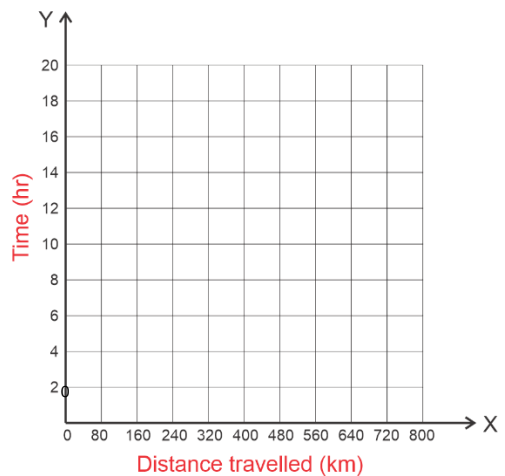
1

x	2	4			18
y	2		8	12	



2

Distance travelled (km)	80	160			640
Time(hr)	2		6	12	



## Comparing the ratios

To compare the ratios, make the denominator of the ratios same (by taking the LCM) and then compare the numerator.

**Example** Compare 3 : 7 and 5 : 9

$$\frac{3}{7} = \frac{3 \times 9}{7 \times 9} = \frac{27}{63}$$

$$\frac{5}{9} = \frac{5 \times 7}{9 \times 7} = \frac{35}{63}$$

We know,  $35 > 27$

Therefore  $\frac{35}{63} > \frac{27}{63}$ , it means  $\frac{5}{9} > \frac{3}{7}$ .

**Example** Compare  $\frac{8}{15}$  and  $\frac{11}{25}$

LCM of 15 and 25 is 75

$$\frac{8 \times 5}{15 \times 5} = \frac{40}{75}, \frac{11 \times 3}{25 \times 3} = \frac{33}{75}$$

We know,  $40 > 33$

Therefore  $\frac{40}{75} > \frac{33}{75}$ , it means  $\frac{8}{15} > \frac{11}{25}$ .

**Example** Jonas has 5 green and 7 blue marbles. Ryan has 8 green and 9 blue marbles. Who has a lesser ratio of green to blue marbles?

Jonas has 5 green and 7 blue marbles. The ratio of green to blue marbles =  $\frac{5}{7}$

Ryan has 8 green and 9 blue marbles. The ratio of green to blue marbles =  $\frac{8}{9}$

LCM of 7 and 9 is 63.

$$\frac{5}{7} = \frac{5 \times 9}{7 \times 9} = \frac{45}{63}$$

$$\frac{8}{9} = \frac{8 \times 7}{9 \times 7} = \frac{56}{63}$$

We know,  $45 < 56$

Therefore  $\frac{45}{63} < \frac{56}{63}$ , it means  $\frac{5}{7} < \frac{8}{9}$ . Jonas has a lesser ratio of green to blue marbles.

### Work sheet 10.10

Compare the ratios.

1  $\frac{3}{20}$  and  $\frac{8}{16}$  \_\_\_\_\_

2  $\frac{19}{17}$  and  $\frac{23}{14}$  \_\_\_\_\_

3  $\frac{15}{29}$  and  $\frac{17}{8}$  \_\_\_\_\_

4  $\frac{60}{45}$  and  $\frac{32}{24}$  \_\_\_\_\_

5  $\frac{21}{30}$  and  $\frac{63}{90}$  \_\_\_\_\_

6  $\frac{6}{13}$  and  $\frac{5}{9}$  \_\_\_\_\_

7  $\frac{56}{28}$  and  $\frac{8}{14}$  \_\_\_\_\_

8  $\frac{16}{43}$  and  $\frac{21}{2}$  \_\_\_\_\_

- 9 Joseph has 14 chickens and 18 ducks. Harper has 26 chickens and 8 ducks. Who has a greater ratio of chickens to ducks?

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- 10 Two alloys A and B are made up of copper and gold. The ratio of copper to gold in A is 3 : 7 and in B is 6 : 21. Which of the alloys have more copper in it?

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- 11 Anne bought 32 books and 18 pens to donate. Mary bought 18 books and 150 pens to donate. Who will donate less books to pens?

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# Comparing the rates

To compare the rates of given measures, convert the rates into unit rates.

**Example** Compare, 20 pens cost \$8 and 40 pens cost \$10.

Cost of 20 pens = \$8

Cost of 1 pen =  $\frac{8}{20}$  i.e. \$0.40

Cost of 40 pens = \$10

Cost of 1 pen =  $\frac{10}{40}$  i.e \$0.25

Unit rate of \$0.25 is less than \$0.40.

As the unit rate of 40 pens cost \$10 is less than 20 pens cost \$8, so \$40 pens cost \$10 is the best deal.

## Work sheet 10.11

- 1 Compare, 6 cans of juice cost \$30 and 8 cans of juice cost \$48.

\_\_\_\_\_

- 2 Who walks faster: Harry walks 2 miles in 40 minutes and Sean walks 4.2 miles in 2 hours.

\_\_\_\_\_

- 3 Compare, 2 books cost \$30 and 5 books cost \$50.

\_\_\_\_\_

- 4 Tobin wants to buy some shirts in a sale. Brand A offers a discounted price of \$100 for 5 shirts and Brand B offers a price of \$150 for 10 shirts. Which brand is offering the best deal?

\_\_\_\_\_

- 5 Compare, 4 litres of milk at \$8 and 10 litres of milk at \$15.

\_\_\_\_\_

- 6 Charles covers a distance of 60 miles in 15 minutes and Dan covers a distance of 300 miles in 2 hours. Who is driving fast?

\_\_\_\_\_

- 7 Which is best : 3 kg cheese cost \$21 and 5 kg cheese cost \$30?

\_\_\_\_\_

## Word problems based on ratios and rates

**Example** Debby is going to meet her mother to a nearby town. If she covers a distance of 80 miles in 2 hours, how much distance she will cover in 5 hours ?

Distance covered in 2 hours = 80 miles

Distance covered in 1 hour =  $\frac{80}{2} = 40$  miles

Distance covered in 5 hours =  $40 \times 5 = 200$  miles

### Work sheet 10.12

- 1 If a car is travelling 250 miles on 15 gallons of gas, how far car will travel on 25 gallons of gas?  
\_\_\_\_\_
- 2 Levin wants to buy 8 kg apples. If the cost of 25 kg apples is \$75, how much Levin will pay for the apples?  
\_\_\_\_\_
- 3 If the weight of a 200 m wire is 9 kg, what will be the weight of 40 m wire?  
\_\_\_\_\_
- 4 Tammy wants to watch a movie on her birthday. The cost of 3 tickets is \$12. She invited her 8 friends for the movie. How much she will have to spend for movie?  
\_\_\_\_\_
- 5 Cindy is paying \$400 house rent for 5 months. How much rent she will pay in 1 year?  
\_\_\_\_\_
- 6 A bread weighing 45 grams contains 135 calories in it. How many calories will be there in a loaf of bread weighing 500 grams?  
\_\_\_\_\_
- 7 Zach takes 123 hours to complete 3 paintings for an exhibition. How much time he will take to paint 25 paintings?  
\_\_\_\_\_
- 8 Lisa is reading a novel of 300 pages. She takes 4 hours to read 34 pages. How much time she will take to read complete novel?  
\_\_\_\_\_

Name: \_\_\_\_\_

Grade: \_\_\_\_\_

## Ratios in proportion

Two equal ratios are always in proportion.

We can also say that if the product of means is equal to the product of extremes then the ratios are in proportion.

**Example** Check whether ratios are in proportion.

3 boys : 8 girls

9 boys : 24 girls

Find the product of means and extremes.

$$\frac{3}{8} \times \frac{9}{24}$$

$$3 \times 24 = 72, 9 \times 8 = 72$$

Cross products are equal, therefore ratios are in proportion.

### Work sheet 10.13

Check whether the ratios are in proportion.

1 26 : 15 and 13 : 5 \_\_\_\_\_

2 96 : 58 and 24 : 29 \_\_\_\_\_

3 14 : 35 and 2 : 5 \_\_\_\_\_

4  $\frac{6}{11}$  and  $\frac{3}{2}$  \_\_\_\_\_

5 54 : 9 and 18 : 3 \_\_\_\_\_

6 250 : 84 and 50 : 42 \_\_\_\_\_

7 150 : 600 and 10 : 40 \_\_\_\_\_

8 174 : 90 and 522 : 280 \_\_\_\_\_

## Solve the proportion

To solve the proportion, do the cross multiplication.

**Example**  $\frac{6}{a} = \frac{18}{24}$

When ratios are in proportion, product of means is equal to the product of extremes.

$$6 \times 24 = 18 \times a$$

$$a = \frac{6 \times 24}{18} = 8$$

$$a = 8$$

### Work sheet 10.14

Solve the proportion and find the value of unknown.

1  $\frac{5}{a} = \frac{25}{40}$  \_\_\_\_\_

2  $\frac{30}{40} = \frac{P}{8}$  \_\_\_\_\_

3  $\frac{9}{14} = \frac{b}{42}$  \_\_\_\_\_

4  $\frac{27}{33} = \frac{r}{132}$  \_\_\_\_\_

5  $\frac{64}{c} = \frac{8}{9}$  \_\_\_\_\_

6  $\frac{77}{q} = \frac{7}{121}$  \_\_\_\_\_

7  $\frac{a}{50} = \frac{12}{150}$  \_\_\_\_\_

8  $\frac{250}{100} = \frac{a}{2}$  \_\_\_\_\_

9  $\frac{48}{b} = \frac{24}{8}$  \_\_\_\_\_

10  $\frac{375}{b} = \frac{25}{90}$  \_\_\_\_\_

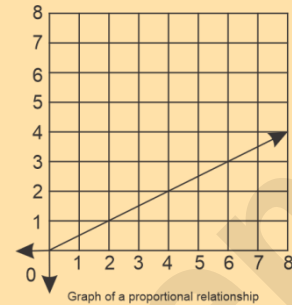
# Proportional relationship on graph

When two ratios are in proportion, the two quantities involved are in proportional relationship.

Proportional relationship possess a graph of a straight line that passes through the origin.

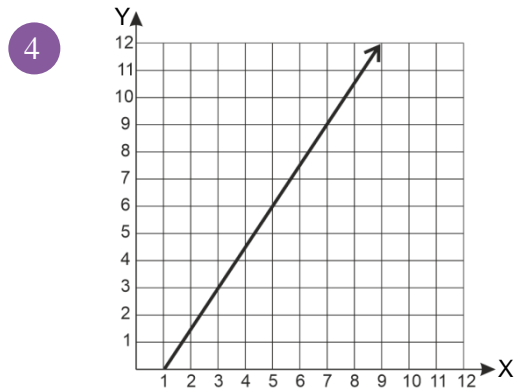
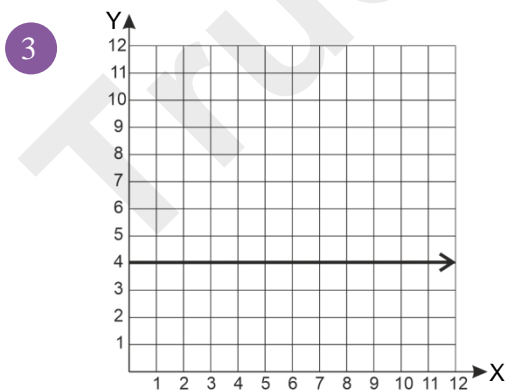
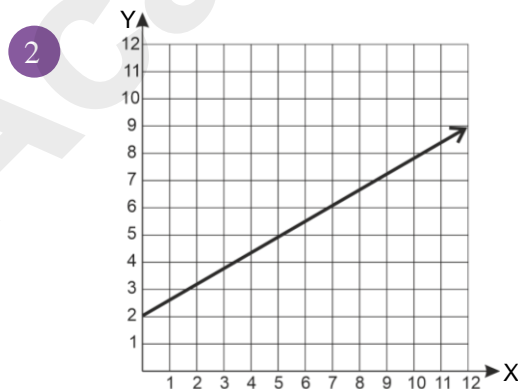
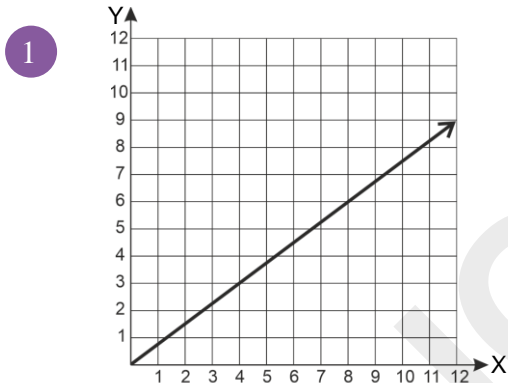
**Direct proportion:** If one quantity increases other quantity also increases and if one quantity decreases other quantity also decreases. This is a direct proportion.

**Example:**



## Work sheet 10.15

Write whether the graphs show a proportional relationship or not.



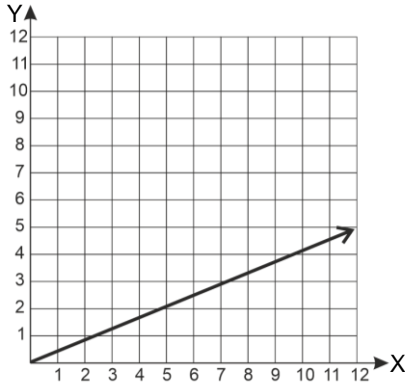


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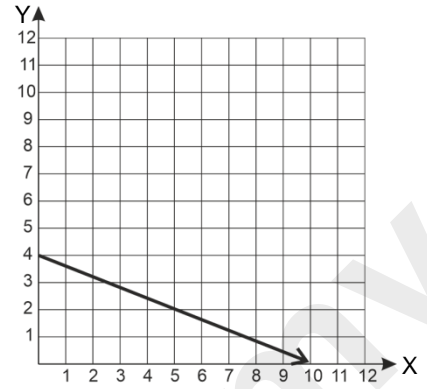
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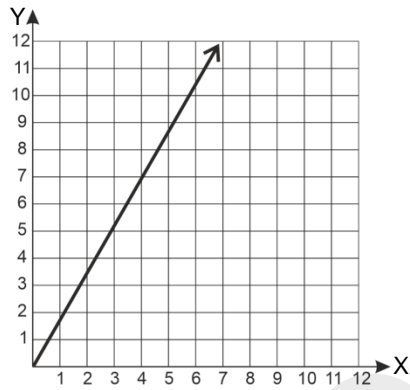
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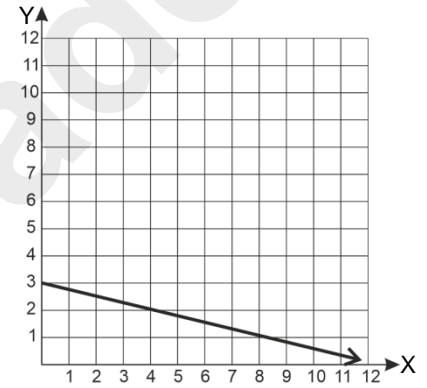
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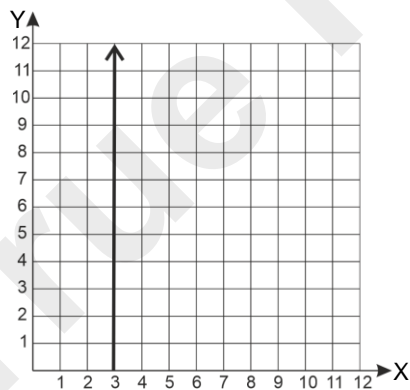
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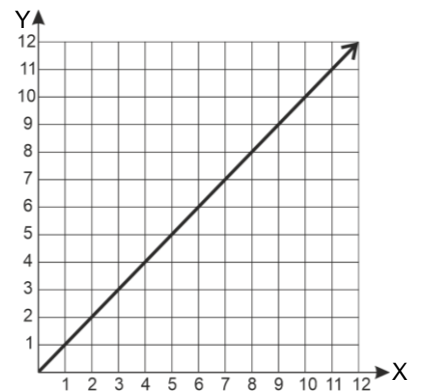
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9



10



Name: \_\_\_\_\_

Grade: \_\_\_\_\_

10.16

# Proportional relationships in tables

When the ratio of  $y$  to  $x$  is same for each column or row then the given table shows a proportional relationship.

**Example** Check the proportional relationship.

x	2	4	8	10
y	3	6	12	15

$$\frac{y}{x} = \frac{3}{2}, \frac{6}{4} = \frac{3}{2}, \frac{12}{8} = \frac{3}{2}, \frac{15}{10} = \frac{3}{2}$$

Each ratio of table is equal to  $\frac{3}{2}$ .

Therefore table shows proportional relationship.

## Work sheet 10.16

Check whether the table shows proportional relationship or not.

1

x	4	8	12
y	3	6	9

\_\_\_\_\_

2

x	6	12	3
y	8	16	4

\_\_\_\_\_

3

x	5	10	15
y	7	14	21

\_\_\_\_\_

4

x	1.5	3	4.5
y	4	8	12

\_\_\_\_\_

5

x	5	10	15	40
y	8	16	24	32

\_\_\_\_\_

6

x	11	22	44
y	6	12	18

\_\_\_\_\_

7

x	21	7	42	84
y	18	6	36	72

\_\_\_\_\_

8

x	30	10	20	90
y	45	15	30	135

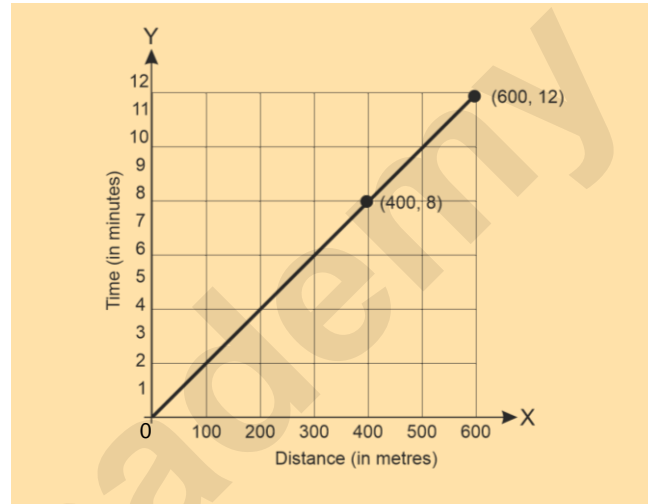
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## Identify proportional relationships by graphing

**Example** Lisa is walking 400m in 8 minutes and Maria is walking 600m in 12 minutes.

Here  $x$  represents the distance and  $y$  represents the time. So according to given values, we get points  $(400, 8)$  and  $(600, 12)$ . Plot these points on the graph.

$x$  and  $y$  will have a proportional relationship as the graph of the line through the points passes through the origin.

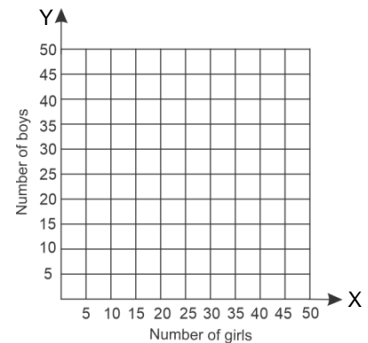


### Work sheet 10.17

#### Check whether the relationship is proportional or not by graphing

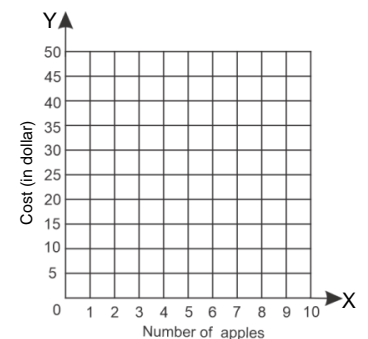
- The number of boys and girls in grade 9th are 40 and 30. The number of boys and girls in grade 10th are 20 and 5. In this relationship,  $y$  represents the number of boys and  $x$  represents the number of girls.

Graph the points for this relationship and the line passing through them.



- The cost of 5 apples is \$30 and cost of 8 apples is \$40. In this relationship,  $y$  represents the cost of apples and  $x$  represents the number of apples.

Graph the points for this relationship and the line passing through them.

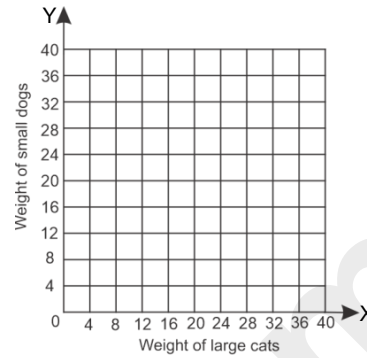


Name: \_\_\_\_\_

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3 The weight of 8 small dogs is approximately equal to 12 large cats and weight of 24 small dogs is approximately equal to 36 large cats. In this relationship,  $y$  represents the weight of small dogs and  $x$  represents the weight of large cats.

Draw the relationship graph for the given values.



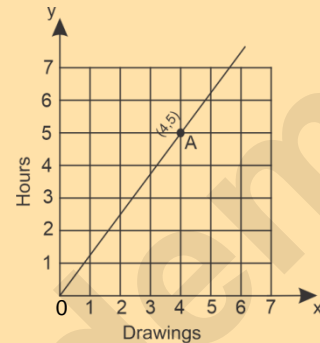
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## Interpret graph of proportional relationship

**Example** The graph shows a proportional relationship between the drawings,  $x$  and time (in hours),  $y$  taken to draw it.

What does the point A represent ?

Point A (4, 5) represents that four drawings have been made in 5 hours.

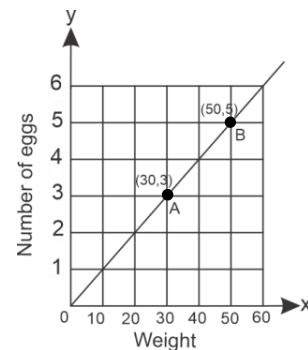


### Work sheet 10.18

1 Charles weighs (in grams) some eggs. The graph shows proportional relationship between the number of eggs,  $y$  and the weight of eggs (in grams),  $x$ .

What do the points A and B represent?

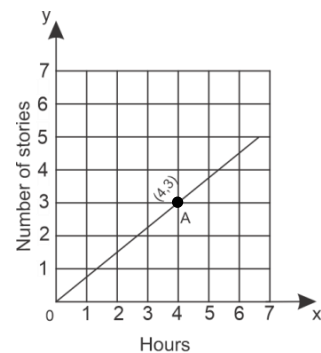
\_\_\_\_\_



2 Anne enjoys reading story books. She spends some of her time in reading. The graph shows the proportional relationship between the number of stories,  $y$  and the time taken (in hours) to read it,  $x$ .

What does the point A represent?

\_\_\_\_\_



## Scale drawings

It is not always possible to draw the actual size of real life objects on the paper. For example, the actual size of an aeroplane or a horse is not easy to show on the paper. To represent such real – life objects, scale drawings are needed.

Scale drawings reduce or enlarge the actual size of real objects by a certain amount.

The scale is shown as a:b where a is the length of drawing on paper and b is the length of real life object.

Scale is also shown as a/b or a to b.

**Example** A car is drawn on a paper. Scale of drawing used is as 1 : 20. If the length of drawing on paper is 14 inches, how long will be the car in actual?

$$\frac{\text{Length of drawing (scale)}}{\text{Real length}} = \frac{1}{20}$$

$$\frac{14}{\text{Real length}} = \frac{1}{20}$$

$$14 \times 20 = 1 \times \text{Real length}$$

$$\text{Real length} = 280 \text{ inches}$$

### Work sheet 10.19

- 1 On a map, the scale is as 5 cm to 4.5 km. If on the map, the distance between two towns is 20 cm, find the actual distance between the towns.  
\_\_\_\_\_
- 2 Luke is an architect. He made a scale drawing for a factory. The measurements of his drawing are 20 inches by 15 inches. Find the actual measurements of the factory if the scale factor used by Luke is 1 inch = 10 ft.  
\_\_\_\_\_
- 3 The scale of a building is 1 inch as 5 feet. A room of building is drawn on the scale of 7 inches.  
What is the actual length of the room?  
\_\_\_\_\_
- 4 Debby is building a model of a castle. Her model is in rectangular shape. The dimensions of its base are 5 feet by 7 feet. If Debby is using a 1:160 scale model, what will be the dimensions of the actual castle?  
\_\_\_\_\_
- 5 A road map shows the distance between two cities as 16 inches. The scale used is 1 inch = 25 miles. How much distance one has to cover to travel from one city to another in actual?  
\_\_\_\_\_

# Answer Key

## Worksheet 10.1

- 5:3 or 5/3
- 5:4 or 5/4
- 4:5 or 4/5
- 5:6 or 5/6
- 5:6 or 5/6

## Worksheet 10.2

- 5:2
- 65:123
- 12:5
- 19:34
- 53:47
- 59:213
- 4:9
- 8:42 or 4:21

## Worksheet 10.3

- Yes
- Yes
- No
- Yes
- Yes
- No
- No
- Yes
- Yes
- No

## Worksheet 10.4

- 3
- 1
- 144
- 17
- 25
- 13
- 1210
- 7
- 150,  $\frac{4}{15}$
- 200,  $\frac{7}{25}$
- 180,  $\frac{10}{11}$
- 10,  $\frac{21}{30}$
- 56,  $\frac{7}{13}$
- 34,  $\frac{62}{68}$
- 6,  $\frac{1}{2}$
- 3,  $\frac{8}{6}$

## Worksheet 10.5

- |   |    |    |    |
|---|----|----|----|
| 7 | 14 | 21 | 28 |
| 3 | 6  | 9  | 12 |
- |   |    |    |    |    |
|---|----|----|----|----|
| 4 | 8  | 12 | 16 | 20 |
| 9 | 18 | 27 | 36 | 45 |
- |    |   |     |    |     |
|----|---|-----|----|-----|
| 25 | 5 | 125 | 75 | 175 |
| 36 | 6 | 180 | 90 | 210 |
- |    |    |     |    |     |
|----|----|-----|----|-----|
| 16 | 8  | 64  | 32 | 80  |
| 26 | 13 | 104 | 52 | 130 |
- |     |    |    |     |     |
|-----|----|----|-----|-----|
| 100 | 20 | 10 | 400 | 600 |
| 150 | 30 | 15 | 600 | 900 |
- |    |   |    |    |    |
|----|---|----|----|----|
| 12 | 2 | 8  | 4  | 16 |
| 30 | 5 | 20 | 10 | 40 |

## Worksheet 10.6

- Yes
- Yes
- Yes
- No
- No
- No
- No
- No
- No
- Yes

## Worksheet 10.7

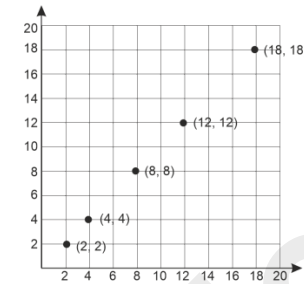
- 20 page
- 4 drawing
- 9 chocolates
- 9 flowers
- 30 students

## Worksheet 10.8

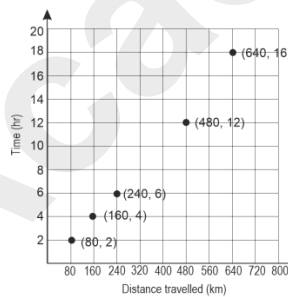
- 30 points
- 20 l
- 60 minutes
- 60 kg
- 500 students
- \$6400
- 3 hours

## Worksheet 10.9

- |   |   |   |   |    |    |
|---|---|---|---|----|----|
| x | 2 | 4 | 8 | 12 | 18 |
| y | 2 | 4 | 8 | 12 | 18 |



- |                         |    |     |     |     |     |
|-------------------------|----|-----|-----|-----|-----|
| Distance travelled (km) | 80 | 160 | 240 | 480 | 640 |
| Time (hr)               | 2  | 4   | 8   | 12  | 18  |



## Worksheet 10.10

- $\frac{3}{20} < \frac{8}{16}$
- $\frac{19}{17} < \frac{23}{14}$
- $\frac{15}{29} < \frac{17}{8}$
- $\frac{60}{45} = \frac{32}{24}$
- $\frac{21}{30} = \frac{63}{90}$
- $\frac{6}{13} < \frac{5}{9}$
- $\frac{56}{28} > \frac{8}{14}$
- $\frac{16}{43} < \frac{21}{2}$
- Harper
- alloy A
- Mary will donate less

## Worksheet 10.11

- 6 cans of juice for \$30 is best deal

- Harry walks faster
- 5 books for \$50 is best deal
- Brand A is offering best deal
- 10 l of milk at \$15 is best deal
- Charles is driving faster.
- 5 kg cheese cost \$30 is best deal

## Worksheet 10.12

- 416.6 miles
- \$24
- 1.8 kg
- \$32
- \$960
- 1500 calories
- 1025 hours
- 35.29 hours

## Worksheet 10.13

- No
- No
- Yes
- No
- Yes
- No
- Yes
- No

## Worksheet 10.14

- a = 8
- p = 6
- b = 27
- r = 108
- c = 72
- q = 1331
- a = 4
- a = 5
- b = 16
- b = 1350

## Worksheet 10.15

- Yes
- No
- No
- No
- Yes
- No
- Yes
- No
- No
- Yes

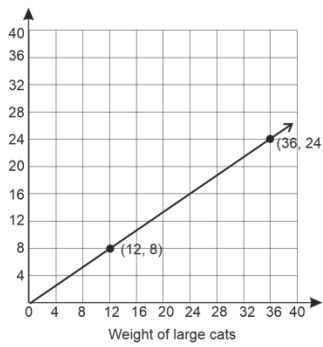
Name: \_\_\_\_\_

Grade: \_\_\_\_\_

**Worksheet 10.16**

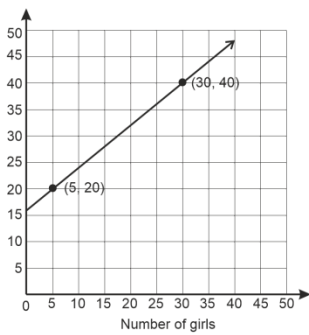
1. Yes
2. Yes
3. Yes
4. Yes
5. No
6. No
7. Yes
8. Yes

3. Yes



**Worksheet 10.17**

1. No



**Worksheet 10.18**

1. Point A shows that 3 eggs weight 30 grams. Point B shows that 5 eggs weight 50 grams.
2. Point A represents that Anne read 3 stories in 4 hours.

**Worksheet 10.19**

1. 18 km
2. 200 feet by 150 feet
3. 35 feet
4. 800 feet by 1120 feet
5. 400 miles

2. No

