Ex 8.1

A scientific calculator is permitted throughout this exercise.

Name:

Worked Example for Simple Questions

The cost (C) of a ride share is given by:

$$C = F + 0.4 \times t$$

Calculate the cost (C) when $F = 3$ and $t = 25$

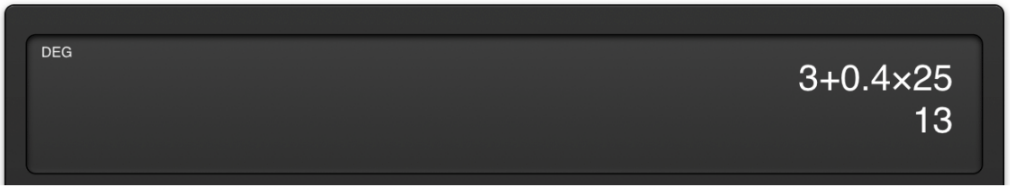
$C =$ 13

* sub F and t into the formula.

$C = F + 0.4 \times t$

$= 3 + 0.4 \times 25$

$= 13$



Question 1

The cost (C) of a ride share is given by:

$$C = F + 0.5 \times t$$

Calculate the cost (C) when $F = 5$ and $t = 18$

$C =$

Question 2

The cost (C) of a ride share is given by:

$$C = F + 0.5 \times t$$

Calculate the cost (C) when $F = 8$ and $t = 18$

$C =$

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Question 3

The cost (C) of a ride share is given by:

$$C = F + 0.6 \times t$$

Calculate the cost (C) when $F = 8$ and $t = 25$

$C =$ ☐

Question 4

The cost (C) of a ride share is given by:

$$C = F + 0.5 \times t$$

Calculate the cost (C) when $F = 10$ and $t = 22$

$C =$ ☐

Question 5

The cost (C) of a ride share is given by:

$$C = F + 0.7 \times t$$

Calculate the cost (C) when $F = 5$ and $t = 30$

$C =$ ☐

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Worked Example for Standard Questions

The points scored, p, are given by $p = 12s + 7t$.

Calculate the points scored when $s = 4$ and $t = 8$.

$p =$ 104

substitute $s=4$ and $t=8$ into $p=12s+7t$.

$p = 12s + 7t$

$= (12 \times 4) + (7 \times 8)$

$= 48 + 56$

$= 104$

Question 6

The points scored, p, are given by $p = 3c + 5d$.

Calculate the points scored when $c = 8$ and $d = 3$.

$p =$ ☐

Question 7

The points scored, p, are given by $p = 4m + 7n$.

Calculate the points scored when $m = 3$ and $n = 6$.

$p =$ ☐

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Substitution into Formulas

Question 8

The points scored, p, are given by $p = 3r + 10s$.

Calculate the points scored when $r = 9$ and $s = 10$.

$p =$ ☐

Question 9

The points scored, p, are given by $p = 7q + 4r$.

Calculate the points scored when $q = 3$ and $r = 7$.

$p =$ ☐

Question 10

The points scored, p, are given by $p = 5k + 3n$.

Calculate the points scored when $k = 11$ and $n = 4$.

$p =$ ☐

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Ex 8.3

No calculators are permitted in this exercise.

Worked Example for Simple Questions

Which option shows the correct expression for the following description?

11 is subtracted from a number, m.

A	B
$m - 11$	$11 - m$

* 11 is subtracted from m, so start with m and subtract 11.

$m - 11$

start with m

subtract 11 from m

Question 1

Which option shows the correct expression for the following description?

9 is subtracted from a number, d.

Circle the correct option

A	B
$9 - d$	$d - 9$

Question 2

Which option shows the correct expression for the following description?

12 is subtracted from a number, d.

Circle the correct option

A	B
$d - 12$	$12 - d$

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Question 3

Which option shows the correct expression for the following description?

2 is subtracted from a number, x.

Circle the correct option

A

$2 - x$

B

$x - 2$

Question 4

Which option shows the correct expression for the following description?

20 is subtracted from a number, x.

Circle the correct option

A

$20 - x$

B

$x - 20$

Question 5

Which option shows the correct expression for the following description?

5 is subtracted from a number, y.

Circle the correct option

A

$5 - y$

B

$y - 5$

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Worked Example for Standard Questions

Which option shows the correct expression for:

y is subtracted from 6 and the result is divided by 5.

A

$$\frac{6-y}{5}$$

B

$$\frac{y-6}{5}$$

C

$$6-y\div 5$$

- y is subtracted from 6
  - * start with 6
  - * subtract y

$6-y$

- the result is divided by 5
  - * all of 6-y needs to be divided by 5
  - * write as a fraction
  - * 6-y is the numerator
  - * 5 is the denominator

$$\frac{6-y}{5}$$

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Creating Expressions

Question 6

Which option shows the correct expression for:

7 is added to p and the result is multiplied by 3.

Circle the correct option

A

$7 + 3p$

B

$p + 7 \times 3$

C

$3(p + 7)$

Question 7

Which option shows the correct expression for:

5 is subtracted from k and the result is divided by 6.

Circle the correct option

A

$\frac{5 - k}{6}$

B

$\frac{k - 5}{6}$

C

$k - 5 \div 6$

Question 8

Which option shows the correct expression for:

m is multiplied by 6 and 1 is added to the result.

Circle the correct option

A

$6(m + 1)$

B

$m + 6$

C

$6m + 1$

Question 9

Which option shows the correct expression for:

q is multiplied by 6 and 3 is added to the result.

Circle the correct option

A

$6q + 3$

B

$9q$

C

$3q + 6$

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Question 10

Which option shows the correct expression for:

5 is substracted from z and the result is divided by 6.

Circle the correct option

A

$6(z-5)$

B

$\frac{z-5}{6}$

C

$\frac{5-z}{6}$

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Ex 8.5

No calculators are permitted in this exercise.

Worked Example for Simple Questions

Eve was investigating the effect of speed on travel time.
The table below shows her results.

Distance (km)	Speed (km/h)	Travel time (min)
20	30	40
20	40	30
20	50	24
20	60	20
20	70	17.1

INCREASES DECREASE

What goes in the blank?

As speed increases the travel time decreases.

A

increases

B

decreases

* Look at the table and see what happens to travel time as speed increases.

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Question 1

Komal was investigating the effect of speed on travel time.
The table below shows her results.

Distance (km)	Speed (km/h)	Travel time (min)
10	40	15
10	45	13.3
10	50	12
10	55	10.9
10	60	10

What goes in the blank?

As speed increases the travel time _____.

Circle the correct option

A

increases

B

decreases

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Question 2

Elizabeth was investigating the effect of volume on concentration.
The table below shows her results.

Amount of substance (n)	Volume (V)	Concentration (C)
4	10	0.4
4	4	1
4	1	4
4	0.5	8
4	0.25	16

What goes in the blank?

As volume decreases the concentration _____.

Circle the correct option

A

decreases

B

increases

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Question 3

Elizabeth was investigating the effect of density on volume.
The table below shows her results.

Mass (m)	Density (D)	Volume (V)
8	0.25	32
8	0.5	16
8	1	8
8	2	4
8	4	2

What goes in the blank?

As density increases the volume _____.

Circle the correct option

A

decreases

B

increases

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Question 4

Stephen was investigating the effect of mass on acceleration.
The table below shows his results.

Force (N)	Mass (kg)	Acceleration (m/s^2)
100	60	1.7
100	50	2
100	40	2.5
100	30	3.3
100	20	5

What goes in the blank?

As mass decreases the acceleration _____.

Circle the correct option

A

increases

B

decreases

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Question 5

Komal was investigating the effect of speed on travel time.
The table below shows her results.

Distance (km)	Speed (km/h)	Travel time (min)
10	100	6
10	90	6.7
10	80	7.5
10	60	10
10	50	12

What goes in the blank?

As speed decreases the travel time _____.

Circle the correct option

A

increases

B

decreases

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Worked Example for Standard Questions

This table shows the distance travelled after a given amount of time.

speed (km/hr)	time $(hours)$	distance (km)
40	1	40
40	2	80
40	3	120
40	4	160

increases

also increases

What happens as you **increase** the time travelled in hours?

A

the distance increases

B

the distance decreases

C

the distance stays the same

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Question 6

This table shows the density as the volume changes.

volume (cm^3)	mass (g)	density (g/cm^3)
1	15	15
8	15	1.875
27	15	0.5556
64	15	0.2343

What happens as you **increase** the volume?

Circle the correct option

A

the density increases

B

the density decreases

C

the density stays the same

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Question 7

This table shows the density as the volume changes.

volume (cm^3)	mass (g)	density (g/cm^3)
1	100	100
8	100	12.55
27	100	3.703
64	100	1.5625

What happens as you **increase** the volume?

Circle the correct option

A

the density decreases

B

the density increases

C

the density stays the same

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Question 8

This table shows the distance travelled after a given amount of time.

speed (km/hr)	time $(hours)$	distance (km)
100	1	100
100	2	200
100	3	300
100	4	400

What happens as you **increase** the time travelled in hours?

Circle the correct option

A

the distance increases

B

the distance decreases

C

the distance stays the same

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Question 9

This table shows the density as the volume changes.

volume (cm^3)	mass (g)	density (g/cm^3)
1	10	10
8	10	1.25
27	10	0.3703
64	10	0.1562

What happens as you **increase** the volume?

Circle the correct option

A

the density increases

B

the density decreases

C

the density stays the same

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Question 10

This table shows the distance travelled after a given amount of time.

speed (km/hr)	time $(hours)$	distance (km)
50	1	50
50	2	100
50	3	150
50	4	200

What happens as you **increase** the time travelled in hours?

Circle the correct option

A

the distance decreases

B

the distance increases

C

the distance stays the same

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Ex 8.7

No calculators are permitted in this exercise.

Worked Example for Simple Questions

There are 7 plums and 3 peaches in a bowl.

What is the ratio of **plums** to **peaches**?

7 : 3

plums : peaches

7 : 3

Question 1

There are 4 apples and 9 bananas in a bowl.

What is the ratio of **apples** to **bananas**?

☐ : ☐

Question 2

There are 13 apricots and 9 nectarines in a bowl.

What is the ratio of **apricots** to **nectarines**?

☐ : ☐

Question 3

There are 3 bananas and 7 peaches in a bowl.

What is the ratio of **bananas** to **peaches**?

☐ : ☐

Question 4

There are 2 mangoes and 3 limes in a bowl.

What is the ratio of **mangoes** to **limes**?

☐ : ☐

Question 5

There are 5 kiwi fruit and 2 oranges in a bowl.

What is the ratio of **kiwi fruit** to **oranges**?

☐ : ☐

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Worked Example for Standard Questions

There are 6 passionfruit and 13 strawberries in a bowl.

What is the ratio of **strawberries** to **fruit in the bowl**?

13 : 19

13 strawberries

6 + 13 = 19 pieces of fruit in the bowl

Question 6

There are 11 apricots and 4 plums in a bowl.

What is the ratio of **plums** to **fruit in the bowl**?

____ : ____

Question 7

There are 5 nectarines and 8 apples in a bowl.

What is the ratio of **nectarines** to **fruit in the bowl**?

____ : ____

Question 8

There are 3 apples and 8 bananas in a bowl.

What is the ratio of **apples** to **fruit in the bowl**?

____ : ____

Question 9

There are 4 apples and 9 bananas in a bowl.

What is the ratio of **bananas** to **fruit in the bowl**?

____ : ____

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Question 10

There are 5 kiwi fruits and 2 oranges in a bowl.

What is the ratio of **kiwi fruit** to **fruit in the bowl**?

$\square : \square$

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Ex 8.9

A calculator is permitted throughout this exercise.

Worked Example for Simple Questions

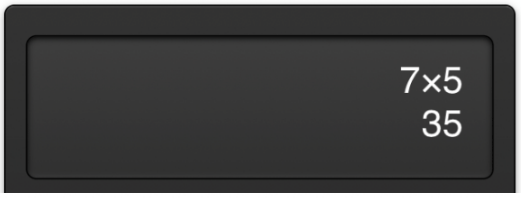
What goes in the blank?

$$4 : 7 = 20 : \boxed{35}$$

×5

×5

* work out what the first part of the ratio has been multiplied by, then use that to calculate the other part.



Question 1

What goes in the blank?

$$7 : 2 = 14 : \square$$

Question 2

What goes in the blank?

$$4 : 5 = 8 : \square$$

Question 3

What goes in the blank?

$$2 : 3 = 12 : \square$$

Question 4

What goes in the blank?

$$3 : 4 = 9 : \square$$

Question 5

What goes in the blank?

$$5 : 1 = 10 : \square$$

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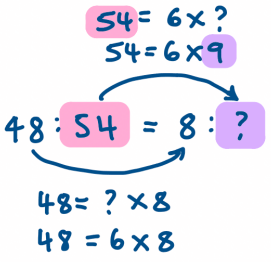
Worked Example for Standard Questions

What number goes in the blank?

$48 : 54 = 8 : \square$



1. Work out $48 = ? \times 8$
$48 = 6 \times 8$
2. Use the result from above
$54 = 6 \times ?$
$54 = 6 \times 9$

The missing number is 9.

Question 6

What number goes in the blank?

$2 : 3 = 14 : \square$

Question 7

What number goes in the blank?

$18 : \square = 3 : 5$

Question 8

What number goes in the blank?

$3 : 7 = \square : 77$

Question 9

What number goes in the blank?

$\square : 21 = 2 : 7$

Question 10

What number goes in the blank?

$5 : 4 = \square : 24$

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A scientific calculator is permitted throughout this exercise.

Ex 8.11

Worked Example for Simple Questions

Simplify the ratio $12 : 15$.

$\boxed{4} : \boxed{5}$

$\div 3$ ($12 : 15$ → $4 : 5$) $\div 3$

1. Divide both parts of the ratio by a common factor, e.g. 3
2. Keep dividing until the only common factor is 1.

Question 1

Simplify the ratio $14 : 21$.

$\square : \square$

Question 2

Simplify the ratio $15 : 55$.

$\square : \square$

Question 3

Simplify the ratio $10 : 35$.

$\square : \square$

Question 4

Simplify the ratio $20 : 25$.

$\square : \square$

Question 5

Simplify the ratio $10 : 25$.

$\square : \square$

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Worked Example for Standard Questions

Simplify the ratio $63 : 81$.

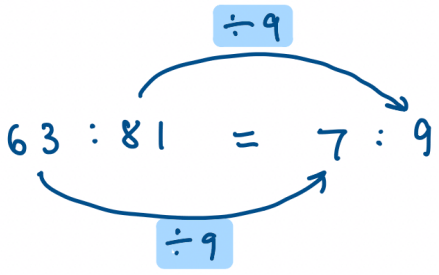
$7 : 9$

Factors of 63 : 1, 3, 7, 9, 21, 63

Factors of 81 : 1, 3, 9, 27, 31

The highest common factor is 9.
Divide both numbers by 9.

$81 \div 9 = 9$



$63 \div 9 = 7$

Question 6

Simplify the ratio $63 : 28$.

$\square : \square$

Question 7

Simplify the ratio $72 : 45$.

$\square : \square$

Question 8

Simplify the ratio $27 : 72$.

$\square : \square$

Question 9

Simplify the ratio $40 : 72$.

$\square : \square$

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Question 10

Simplify the ratio $36 : 42$.

$\square : \square$

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