Proportion - Worksheet

Skill

Group A - Direct proportion

y is directly proportional to x. Work out the missing value:

1)

x	1	2
y	3	

2)

x	1	5
y	3	

3)

x	1	8
y	3	

4)

x	1	3
y	6	

5)

x	1	5
y	6	

6)

x	1	9
y	6	

7)

x	2	6
y	8	

8)

x	2	7
y	8	

9)

x	2	9
y	8	

10)

x	3	6
y	12	

11)

x	3	7
y	12	

12)

x	3	10
y	12	

Group B - Inverse proportion

y is inversely proportional to x. Work out the missing value:

1)

x	1	2
y	12	

2)

x	1	3
y	12	

3)

x	1	6
y	12	

4)

x	1	2
y	50	

5)

x	1	5
y	50	

6)

x	1	4
y	50	

7)

x	2	4
y	18	

8)

x	2	6
y	18	

9)

x	2	9
y	18	

10)

x	3	6
y	60	

11)

x	3	15
y	60	

12)

x	3	10
y	60	

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Proportion - Worksheet

Group C - Formulas and graphs

x and y are variables. k is a constant. State if the following represent direct proportion, inverse proportion of neither:

1) $y \propto \frac{1}{x}$

2) $y = kx$

3) $y = \frac{4}{x}$

4) $y = 4 + x$

5) $y = \frac{k}{x}$

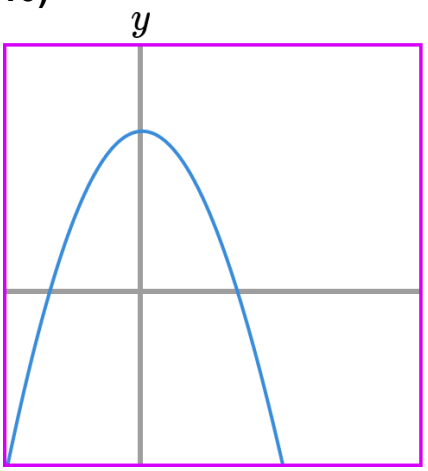
6) $y \propto x$

7) $y = x - k$

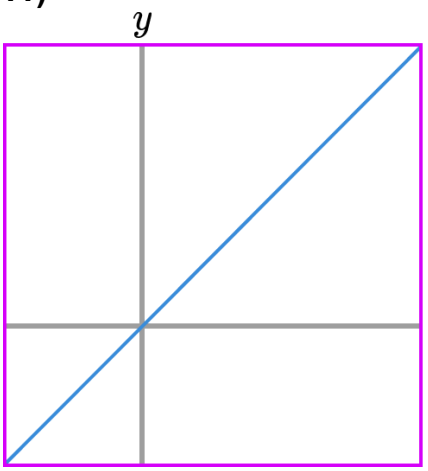
8) $y = \theta x$

9) $y = 4x$

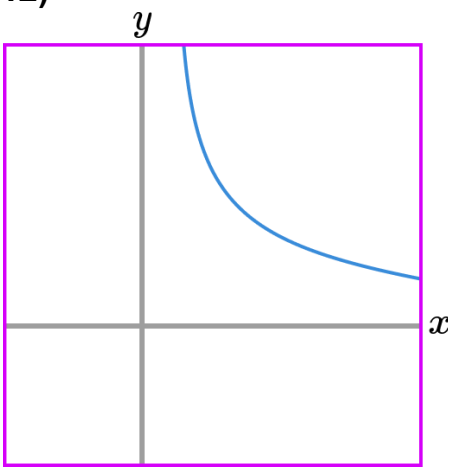
10)



11)



12)



Proportion - Worksheet

Applied

1) **(a)** If 4 apples cost $200p$, find the cost of 7 apples.

(b) If 5 books cost £20, find the cost of 3 books.

2) **(a)** A machine fills 200 bottles in 10 minutes.
How many bottles are filled in 13 minutes?

(b) The total contents of 8 bottles is 15 litres.
What is the contents of 5 bottles?

3) **(a)** A fast train travelling at 100 $kmph$ takes 3 hours to complete a journey.
How long will it take a slower train travelling at 50 $kmph$?

(b) A slow bus travelling at 40 $kmph$ takes 60 minutes to complete a motorway journey. How long will it take a faster bus travelling at 75 $kmph$?

4) **(a)** 7 taps fill a swimming pool in 100 minutes.
How long would it take for 5 taps to fill the same swimming pool?

(b) It takes 3 workers 8 hours to build a shed.
How long would it take 5 workers to build the same type of shed?
Give your answer in hours and minutes.

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Proportion - Exam Questions

1) Here is a recipe for 16 flapjacks:

$125\ g$	Butter
$125\ g$	Golden Syrup
$50\ g$	Sugar
$175\ g$	Oats

(a) Sarah wants to make 32 flapjacks.
How much golden syrup should she use?

.....g
(2)

(b) Tariq wants to make 8 flapjacks.
How much sugar should he use?

.....g
(2)

(c) Ursula has $0.5\ kg$ of oats and plenty of other ingredients.
Can she make 40 flapjacks?

Explain how you got your answer.

(4)
(6 marks)

Proportion - Exam Questions

2) 6 workers take 14 hours to paint a fence.
How many hours do 4 men need to paint the same fence?

……hours
(2 marks)

---

3) Given that y is inversely proportional to x, complete the table of values:

x	1	2	3	8
y	48			

(3 marks)

---

4) (a) y is inversely proportional to x. When $x = 5$, $y = 4$.
Find an equation for y in terms of x.

$y =$……
(3)

(b) Find y when x is 10.

$y =$……
(2)

(c) Find x when y is 0.5.

$x =$……
(2)
(7 marks)

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Proportion - Answers

	Question	Answer
	Skill Questions	
Group A	y is directly proportional to x. Work out the missing value:	

1)

x	1	2
y	3	

1) $y = 6$

2)

x	1	5
y	3	

2) $y = 15$

3)

x	1	8
y	3	

3) $y = 24$

4)

x	1	3
y	6	

4) $y = 18$

5)

x	1	5
y	6	

5) $y = 30$

6)

x	1	9
y	6	

6) $y = 54$

7)

x	2	6
y	8	

7) $y = 24$

8)

x	2	7
y	8	

8) $y = 28$

Proportion - Answers

	9) x | 2 | 9 y | 8 | **10)** x | 3 | 6 y | 12 | **11)** x | 3 | 7 y | 12 | **12)** x | 3 | 10 y | 12 |	**9)** $y = 36$ **10)** $y = 24$ **11)** $y = 28$ **12)** $y = 40$
Group B	y is inversely proportional to x. Work out the missing value: **1)** x | 1 | 2 y | 12 | **2)** x | 1 | 3 y | 12 | **3)** x | 1 | 6 y | 12 | **4)** x | 1 | 2 y | 50 | **5)** x | 1 | 5 y | 50 |	**1)** $y = 6$ **2)** $y = 4$ **3)** $y = 2$ **4)** $y = 25$ **5)** $y = 10$

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Proportion - Answers

Group B contd

6)

x	1	4
y	50	

6) $y = 12.5$

7)

x	2	4
y	18	

7) $y = 9$

8)

x	2	6
y	18	

8) $y = 6$

9)

x	2	9
y	18	

9) $y = 4$

10)

x	3	6
y	60	

10) $y = 30$

11)

x	3	15
y	60	

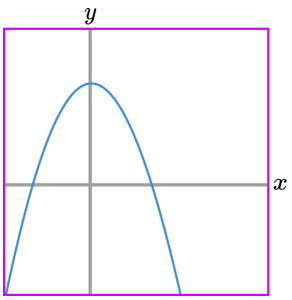
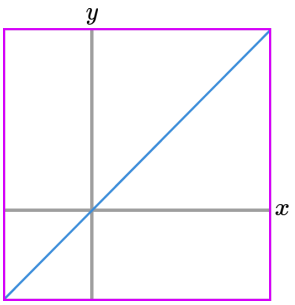
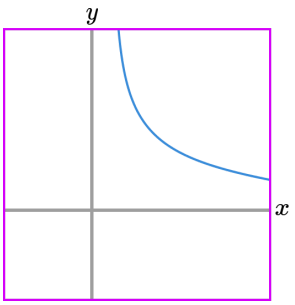
11) $y = 12$

12)

x	3	10
y	60	

12) $y = 18$

Proportion - Answers

Group C	x and y are variables. k is a constant. State if the following represent direct proportion, inverse proportion of neither:	
	1) $y \propto \frac{1}{x}$	**1)** inverse proportion
	2) $y = kx$	**2)** direct proportion
	3) $y = \frac{4}{x}$	**3)** inverse proportion
	4) $y = 4 + x$	**4)** neither
	5) $y = \frac{k}{x}$	**5)** inverse proportion
	6) $y \propto x$	**6)** direct proportion
	7) $y = x - k$	**7)** neither
	8) $y = \theta x$	**8)** neither
	9) $y = 4x$	**9)** direct proportion
	10) 	**10)** neither
	11) 	**11)** direct proportion
	12) 	**12)** inverse proportion

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Proportion - Answers

	Question	Answer
	Applied Questions	
1)	**a)** If 4 apples cost $200p$, find the cost of 7 apples.	**a)** $200 \div 4 \times 7 = 350$ $350p$ or £3.50
	b) If 5 books cost £20, find the cost of 3 books.	**b)** $20 \div 5 \times 3 = 12$ £12
2)	**a)** A machine fills 200 bottles in 10 minutes. How many bottles are filled in 13 minutes?	**a)** $200 \div 10 \times 13 = 260$ 260 bottles
	b) The total contents of 8 bottles is 15 litres. What is the contents of 5 bottles?	**b)** $15 \div 8 \times 5 = 9.375$ 9.375 litres
3)	**a)** A fast train travelling at 100 $kmph$ takes 3 hours to complete a journey. How long will it take a slower train travelling at 50 $kmph$?	**a)** $3 \times 2 = 6$ 6 hours
	b) A slow bus travelling at 40 $kmph$ takes 60 minutes to complete a motorway journey. How long will it take a faster bus travelling at 75 $kmph$?	**b)** $40 \times 60 \div 75 = 32$ 32 mins
4)	**a)** 7 taps fill a swimming pool in 100 minutes. How long would it take for 5 taps to fill the same swimming pool?	**a)** $100 \times 7 \div 5 = 140$ 140 mins = 2 hours 20 mins
	b) It takes 3 workers 8 hours to build a shed. How long would it take 5 workers to build the same type of shed?	**b)** $3 \times 8 \div 5 = 4.8$ 4.8 hours = 4 hours 48 mins

Proportion - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	Here is a recipe for 16 flapjacks: 125 g Butter 125 g Golden Syrup 50 g Sugar 175 g Oats		
(a)	Sarah wants to make 32 flapjacks. How much golden syrup should she use?	**(a)** 125×2 $250\ g$	**(1)** **(1)**
(b)	Tariq wants to make 8 flapjacks. How much sugar should he use?	**(b)** $50 \div 2$ $25\ g$	**(1)** **(1)**
(c)	Ursula has $0.5\ kg$ of oats and plenty of other ingredients. Can she make 40 flapjacks? Explain how you got your answer	**(c)** $0.5 \times 1000 = 500\ g$ $40 \div 16 = 2.5$ $175 \times 2.5 = 437.5\ g$ Yes **and** $437.5\ g$ is less than $500\ g$ **oe**	**(1)** **(1)** **(1)** **(1)**
2)	6 workers take 14 hours to paint a fence. How many hours would 4 men have taken to paint the same fence?	$14 \times 6 \div 4$ 21 hours	**(1)** **(1)**
3)	Given that y is inversely proportional to x, complete the table of values: x 1 2 3 8 y 48	x 1 2 3 8 y 48 **24** **16** **6** 24 16 6	 **(1)** **(1)** **(1)**

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Proportion - Mark Scheme

4) (a)	y is inversely proportional to x. When $x = 5, y = 4$. Find an equation for y in terms of x.	**(a)** $y = \frac{k}{x}$ or $4 = \frac{k}{5}$ **oe** $k = 20$ $y = \frac{20}{x}$	**(1)** **(1)** **(1)**
(b)	Find y when x is 10.	**(b)** $y = \frac{20}{10}$ $y = 2$	**(1)** **(1)**
(c)	Find x when y is 0.5.	**(c)** $0.5 = \frac{20}{x}$ **or** $x = \frac{20}{0.5}$ **oe** $x = 40$	**(1)** **(1)**

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