Inverse proportion - Worksheet

Skill

Group A - Finding the time to complete a job for a different number of workers

Work out:

1) 5 workers take 16 hours to complete a job.
Find the time for 4 workers.

2) 5 workers take 12 hours to complete a job.
Find the time for 4 workers.

3) 5 workers take 10 hours to complete a job.
Find the time for 4 workers.

4) 3 workers take 8 hours to complete a job.
Find the time for 2 workers.

5) 7 workers take 8 hours to complete a job.
Find the time for 2 workers.

6) 9 workers take 8 hours to complete a job.
Find the time for 2 workers.

7) 4 workers take 15 hours to complete a job.
Find the time for 5 workers.

8) 4 workers take 15 hours to complete a job.
Find the time for 6 workers.

9) 4 workers take 15 hours to complete a job.
Find the time for 10 workers.

10) 6 workers take 12 hours to complete a job.
Find the time for 9 workers.

11) 6 workers take 8 hours to complete a job.
Find the time for 9 workers.

12) 6 workers take 5 hours to complete a job.
Find the time for 9 workers.

Group B - Inverse proportion equations

Work out:

1) $y = \frac{12}{x}$
Work out the value of when $x = 2$.

2) $y = \frac{12}{x}$
Work out the value of y when $x = 3$.

3) $y = \frac{12}{x}$
Work out the value of y when $x = 8$.

4) $y = \frac{8}{x}$
Work out the value of y when $x = 2$.

5) $y = \frac{9}{x}$
Work out the value of y when $x = 2$.

6) $y = \frac{15}{x}$
Work out the value of y when $x = 2$.

7) $y = \frac{36}{x}$
Work out the value of y when $x = 3$.

8) $y = \frac{36}{x}$
Work out the value of y when $x = 4$.

9) $y = \frac{36}{x}$
Work out the value of y when $x = 12$.

10) $y = \frac{20}{x}$
Work out the value of y when $x = 10$.

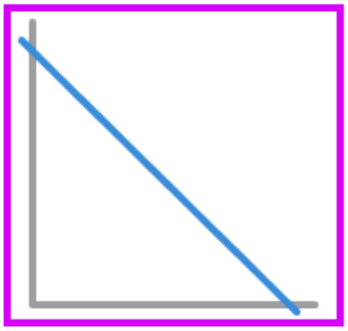
11) $y = \frac{26}{x}$
Work out the value of y when $x = 10$.

12) $y = \frac{33}{x}$
Work out the value of y when $x = 10$.

Group C - Inverse proportion graphs

Identify the graphs representing inverse proportion:

1)



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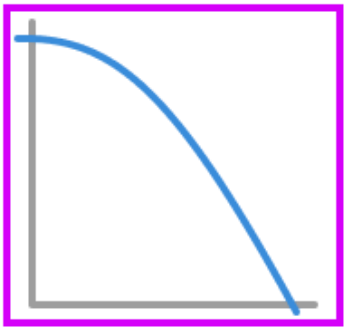

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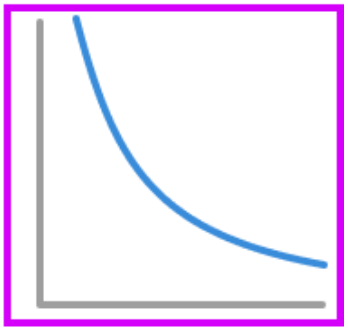

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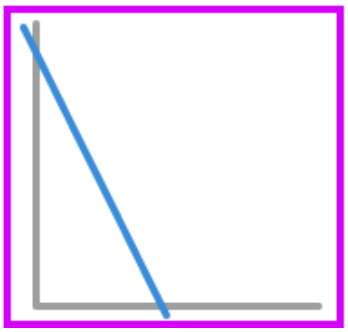

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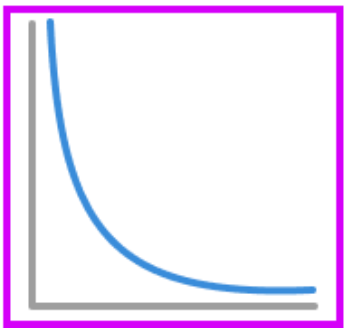
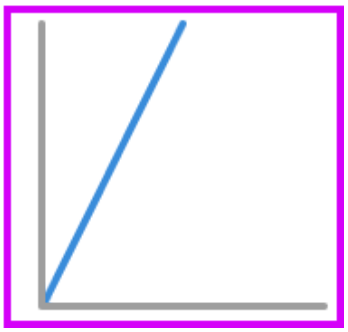


6)



Inverse proportion - Worksheet

Applied

1) **(a)** 7 painters take 10 days to paint a building.
Work out how long it would take 5 painters to paint the building.

(b) 5 painters take 3 days to paint a fence.
Work out how long it would take 6 painters to paint the fence.

2) **(a)** 12 machines take 40 hours to complete a job.
Work out how long it would take 20 machines to complete the same job.

(b) 9 machines take 35 hours to complete a job.
Work out how long it would take 7 machines to complete the same job.

3) **(a)** y is inversely proportional to x.
y is given by the formula
$y = \frac{8}{x}$
Find the value of y when $x = 2$.

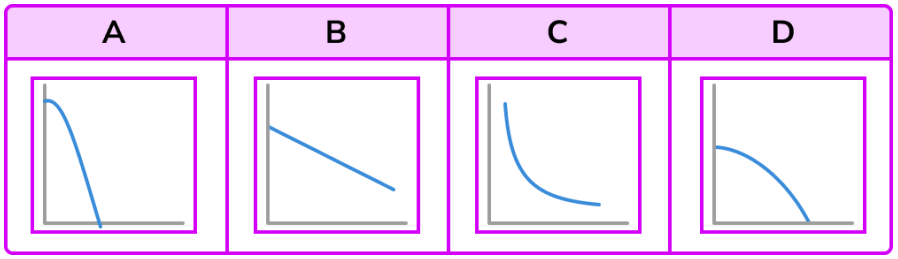
(b) m is inversely proportional to p.
m is given by the formula
$m = \frac{248}{p}$
Find the value of m when $p = 20$.

4) **(a)** y is inversely proportional to x^2.
y is given by the formula
$y = \frac{28}{x^2}$
Find the value of y when $x = 2$.

(b) w is inversely proportional to $\sqrt{t}$ where t is a positive value
w is given by the formula
$w = \frac{180}{\sqrt{t}}$
Find the value of a when $t = 9$.

Inverse proportion - Exam Questions

1) Here are four graphs.



State which graph represents inverse proportionality.

..... **(1 mark)**

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2) It takes 4 painters 9 days to complete a job.

How long would it take 6 painters to complete the same job?

.....days **(2 marks)**

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3) y is inversely proportional to x.

y is given by the formula

$$y = \frac{4.8}{x}$$

Work out the value of y when $x = 4$

..... **(2 marks)**

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4) (a) 6 machines take 5 days to produce 100 items.

Work out how long it would take 10 machines to produce 100 items.

.....days **(2 marks)**

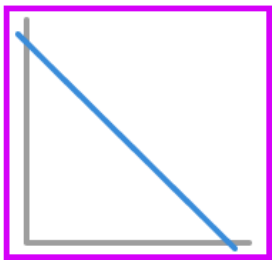
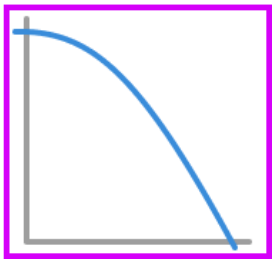
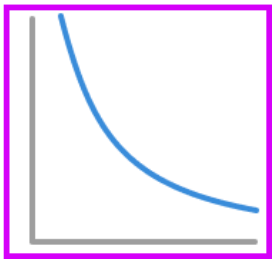
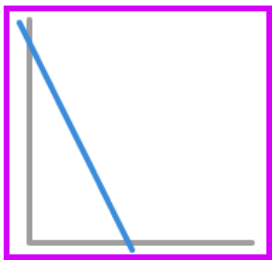
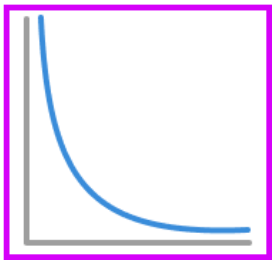
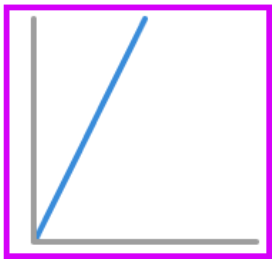
(b) Work out how long it would take 15 machines to produce 700 items.

.....days **(2) (4 marks)**

Inverse proportion - Answers

	Question	Answer
	Skill Questions	
Group A	Work out: **1)** 5 workers take 16 hours to complete a job. Find the time for 4 workers. **2)** 5 workers take 12 hours to complete a job. Find the time for 4 workers. **3)** 5 workers take 10 hours to complete a job. Find the time for 4 workers. **4)** 3 workers take 8 hours to complete a job. Find the time for 2 workers. **5)** 7 workers take 8 hours to complete a job. Find the time for 2 workers. **6)** 9 workers take 8 hours to complete a job. Find the time for 2 workers. **7)** 4 workers take 15 hours to complete a job. Find the time for 6 workers. **8)** 4 workers take 15 hours to complete a job. Find the time for 10 workers. **9)** 4 workers take 15 hours to complete a job. Find the time for 5 workers. **10)** 6 workers take 12 hours to complete a job. Find the time for 9 workers. **11)** 6 workers take 8 hours to complete a job. Find the time for 9 workers.	**1)** 20 hours **2)** 15 hours **3)** 12. 5 hours **4)** 12 hours **5)** 28 hours **6)** 36 hours **7)** 10 hours **8)** 6 hours **9)** 12 hours **10)** 8 hours **11)** 5 hours and 20 mins or 5. 33 hours

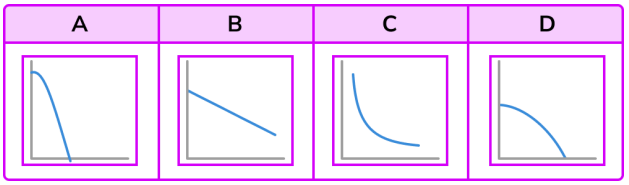
	12) 6 workers take 5 hours to complete a job. Find the time for 9 workers.	**12)** 3 hours and 20 mins or 3.33 hours
Group B	Work out: **1)** $y = \frac{12}{x}$ Work out the value of y when $x = 2$. **2)** $y = \frac{12}{x}$ Work out the value of y when $x = 3$. **3)** $y = \frac{12}{x}$ Work out the value of y when $x = 8$. **4)** $y = \frac{8}{x}$ Work out the value of y when $x = 2$. **5)** $y = \frac{9}{x}$ Work out the value of y when $x = 2$. **6)** $y = \frac{15}{x}$ Work out the value of y when $x = 2$. **7)** $y = \frac{36}{x}$ Work out the value of y when $x = 3$. **8)** $y = \frac{36}{x}$ Work out the value of y when $x = 4$. **9)** $y = \frac{36}{x}$ Work out the value of y when $x = 12$. **10)** $y = \frac{20}{x}$ Work out the value of y when $x = 10$. **11)** $y = \frac{26}{x}$ Work out the value of y when $x = 10$. **12)** $y = \frac{33}{x}$ Work out the value of y when $x = 10$.	**1)** $y = 6$ **2)** $y = 4$ **3)** $y = 1.5$ **4)** $y = 4$ **5)** $y = 4.5$ **6)** $y = 7.5$ **7)** $y = 12$ **8)** $y = 9$ **9)** $y = 3$ **10)** $y = 2$ **11)** $y = 2.6$ **12)** $y = 3.3$

Group C	Identify the graphs representing inverse proportion:	
	1) 	**1)** No
	2) 	**2)** No
	3) 	**3)** Yes
	4) 	**4)** No
	5) 	**5)** Yes
	6) 	**6)** No

Inverse proportion - Answers

	Question	Answer
	Applied Questions	
1)	**a)** 7 painters take 10 days to paint a building. Work out how long it would take 5 painters to paint the building. **b)** 5 painters take 3 days to paint a fence. Work out how long it would take 6 painters to paint the fence.	**a)** 14 days **b)** 2.5 days
2)	**a)** 12 machines take 40 hours to complete a job. Work out how long it would take 20 machines to complete the same job. **b)** 9 machines take 35 hours to complete a job. Work out how long it would take 7 machines to complete the same job.	**a)** 24 hours **b)** 45 hours
3)	**a)** y is inversely proportional to x. y is given by the formula $y = \frac{8}{x}$ Find the value of y when $x = 2$. **b)** m is inversely proportional to p. m is given by the formula $m = \frac{248}{p}$ Find the value of m when $p = 20$.	**a)** $y = 4$ **b)** $m = 12.4$
4)	**a)** y is inversely proportional to x^2. y is given by the formula $y = \frac{28}{x^2}$ Find the value of y when $x = 2$. **b)** w is inversely proportional to $\sqrt{t}$ where t is a positive valuew is given by the formula $w = \frac{180}{\sqrt{t}}$ Find the value of a when $t = 9$.	**a)** $y = \frac{28}{2^2} = \frac{28}{4} = 7$ **b)** $w = \frac{180}{\sqrt{9}} = \frac{180}{3} = 60$

Inverse proportion - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	Here are four graphs.  State which graph represents inverse proportionality.	**(a)** Graph C **(1)**	**(1)**
2)	It takes 4 painters 9 days to complete a job. How long would it take 6 painters to complete the same job?	$4 \times 9 \div 6$ **(1)** $= 6\ days$ **(1)**	**(2)**
3)	y is inversely proportional to x. y is given by the formula $y = \frac{4.8}{x}$ Work out the value of y when $x = 4$	$\frac{4.8}{2}$ **(1)** $= 1.2$ **(1)**	**(2)**
4) (a)	6 machines take 5 days to produce 100 items. Work out how long it would take 10 machines to produce 100 items	**(a)** $6 \times 5 \div 10$ **(1)** $=$ 3 days **(1)**	**(2)**
(b)	Work out how long it would take 15 machines to produce 700 items.	**(b)** $6 \times 5 \times 7 \div 8$ **(1)** $=$ 14 days **(1)**	**(2)**