

# Paper 3 MIB

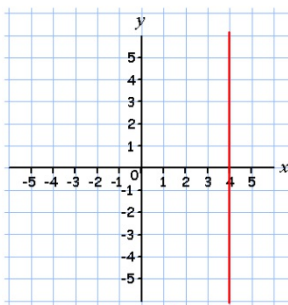
- Watch video on Paper (using QR code)
  - Watch the video on website if still unsure, answering questions at end of video
  - Answer these questions
- This is the best way to revise!

Topic	Question	Video
Drawing Straight Lines	7b	A24
Direct Proportion	15b	R26-28
Pythagoras	23a	G43
Pythagoras Problem Solve	23b	G44
$y = mx + c$	24	A25-27
Similar Shapes	25	G49-50
Error Intervals	26a	N52

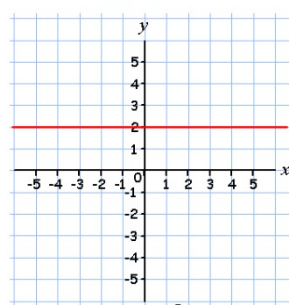
Total of 18 marks on one paper

## Question 7b

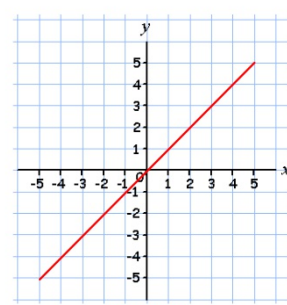
Draw the lines that are beneath the graphs...



x	y
4	0
4	1
4	2
4	3
4	4



x	y
1	2
2	2
3	2
4	2
5	2



x	y
1	1
2	2
3	3
4	4
5	5

Question 15b

A and B are in direct proportion, fill in the blanks.

a	8	48	160
b	6	36	120

Diagram showing relationships between values:

- Red arrow from 8 to 48:  $\times 6$
- Red arrow from 6 to 36:  $\times 6$
- Blue arrow from 8 to 160:  $\times 20$
- Blue arrow from 6 to 120:  $\times 20$

a	6	36	180
b	1.5	9	45

a	2	9	39
b	5	22.5	32.5

a	12	48	84
b	7.2	28.8	50.4

y is directly proportional to x.  
Complete the table.

x	4	9	12
y	24	54	72

y is directly proportional to x.  
Complete the table.

x	2.5	8	31.25
y	4	12.8	50

A and B are in direct proportion.

When  $a = 25$   $b = 10$

A	25	100	250
B	10	40	100

a) Find  $b$  when  $a = 100$   
 $= 40$

b) Find  $a$  when  $b = 100$   
 $= 250$

A and B are in direct proportion.

When  $a = 12$   $b = 8$

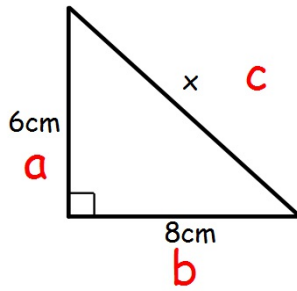
A	12	50	18
B	8	33. $\dot{3}$	12

a) Find  $b$  when  $a = 50$   
 $= 33.\dot{3}$

b) Find  $a$  when  $b = 12$   
 $= 18$

### Question 23a

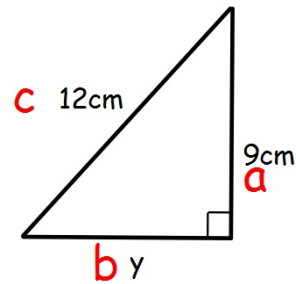
a)



Show that x is 10cm.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 6^2 + 8^2 &= x^2 \\ 100 &= x^2 \\ x &= \sqrt{100} \\ x &= 10 \end{aligned}$$

b)



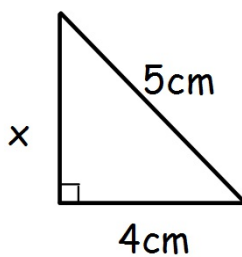
Show that y is 7.94cm when rounded to 2.d.p.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 9^2 + y^2 &= 12^2 \\ y^2 &= 12^2 - 9^2 \\ y^2 &= 63 \\ y &= \sqrt{63} \quad y = 7.94 \end{aligned}$$

### Question 23b

Work out the missing length and then use it to find the area and perimeter of the triangles

a)



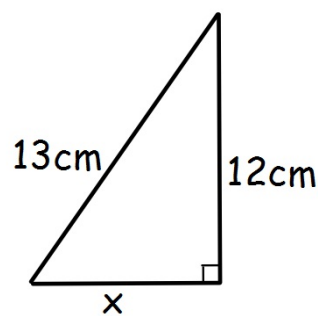
$$\begin{aligned} x^2 + 4^2 &= 5^2 \\ x^2 &= 5^2 - 4^2 \\ x^2 &= 9 \\ x &= 3 \end{aligned}$$

$$x = \underline{3}$$

$$\text{Area} = \underline{6\text{cm}^2} \dots\dots \frac{4 \times 3}{2}$$

$$\text{Perimeter} = \underline{12\text{cm}} \dots\dots 3 + 4 + 5$$

b)



$$\begin{aligned} x^2 + 12^2 &= 13^2 \\ x^2 &= 13^2 - 12^2 \\ x^2 &= 25 \\ x &= 5 \end{aligned}$$

$$x = \underline{5}$$

$$\text{Area} = \underline{30\text{cm}^2} \dots\dots \frac{5 \times 12}{2}$$

$$\text{Perimeter} = \underline{30\text{cm}} \dots\dots 5 + 12 + 13$$

## Question 24

$$y = mx + c \quad m = \text{gradient} \\ c = \text{y intercept}$$

Find the equation of a line that...

(a) has a gradient of 4 and passes through the point  $(1, 10)$

$$\begin{aligned} y &= 4x + c \\ 10 &= 4(1) + c \\ 10 &= 4 + c \\ c &= 6 \end{aligned} \quad y = 4x + 6$$

(b) has a gradient of 2 and passes through the point  $(-3, 3)$

$$\begin{aligned} y &= 2x + c \\ 3 &= 2(-3) + c \\ 3 &= -6 + c \\ c &= 9 \end{aligned} \quad y = 2x + 9$$

(c) has a gradient of 1 and passes through the point  $(5, 2)$

$$\begin{aligned} y &= 1x + c \\ 2 &= 2(5) + c \\ 2 &= 10 + c \\ c &= -8 \end{aligned} \quad y = 1x - 8$$

(d) has a gradient of -3 and passes through the point  $(-2, 8)$

$$\begin{aligned} y &= -3x + c \\ 8 &= -3(-2) + c \\ 8 &= 6 + c \\ c &= 2 \end{aligned} \quad y = -3x + 2$$

(e) has a gradient of -5 and passes through the point (3, -1)

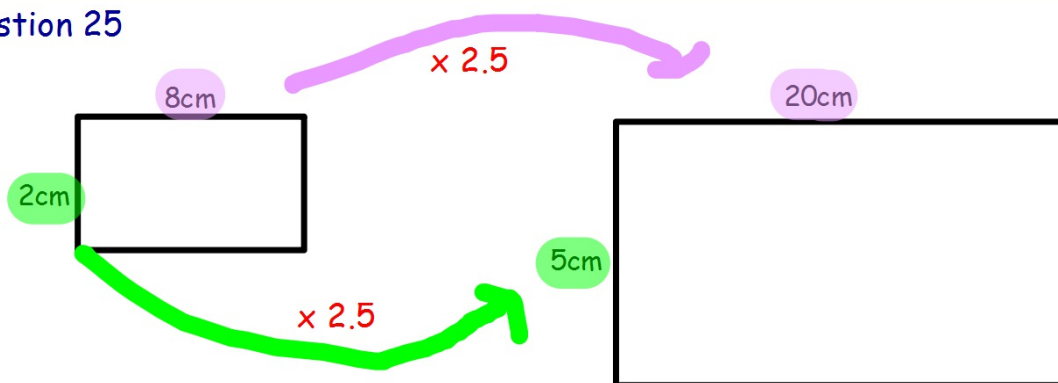
$$\begin{aligned}y &= -5x + c \\-1 &= -5(3) + c \\-1 &= -15 + c \\c &= 14\end{aligned}\quad y = -5x + 14$$

(f) has a gradient of  $\frac{1}{2}$  and passes through the point (4, 5)

$$\begin{aligned}y &= 0.5x + c \\5 &= 0.5(4) + c \\5 &= 2 + c \\c &= 3\end{aligned}\quad y = 0.5x + 3$$

### Question 25

a)

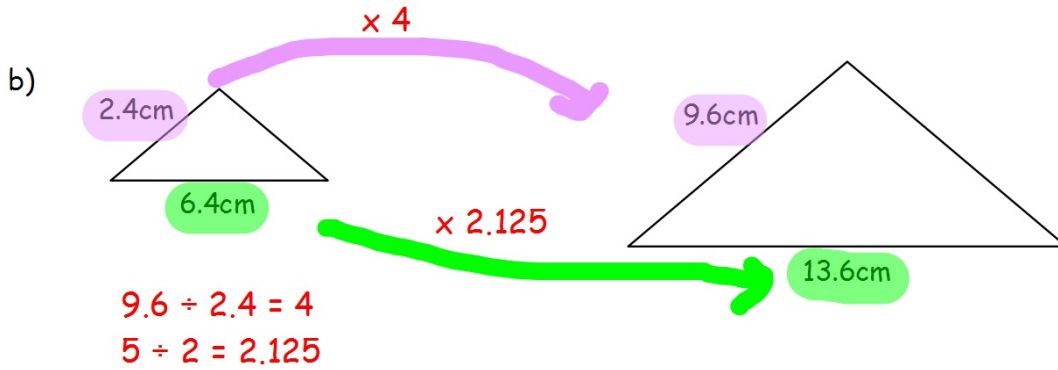


$$20 \div 8 = 2.5$$

$$5 \div 2 = 2.5$$

Are these rectangles similar? Yes

Why? The scale factor is the same for all corresponding sides

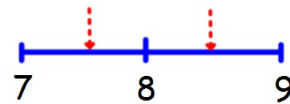


Are these triangles similar? No

Why? **The scale factors are different for the corresponding sides**

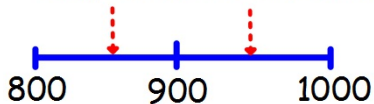
### Question 26a

Question 1: The mass of a coin is 8 grams to the nearest gram.  
Complete the error interval for the mass of the coin



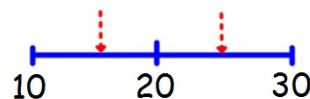
$$\dots\dots\dots 7.5 \dots\dots\dots \text{g} \leq \text{mass} < \dots\dots\dots 8.5 \dots\dots\dots \text{g}$$

Question 2: The distance between two cities is 900km to the nearest 100km.  
Complete the error interval for the distance



$$\dots\dots\dots 850 \dots\dots\dots \text{km} \leq \text{distance} < \dots\dots\dots 950 \dots\dots\dots \text{km}$$

Question 3: Frank rounds a number,  $y$ , to the nearest ten.  
His result is 20  
Write down the error interval for  $y$



$$15 \leq y < 25$$

Question 4: Lily rounds a number,  $y$ , to the nearest whole number.  
Her result is 5  
Write down the error interval for  $y$



$$4.5 \leq y < 5.5$$

Question 5: Freya rounds a number,  $y$ , to one decimal place.

Her result is 6.4

Write down the error interval for  $y$

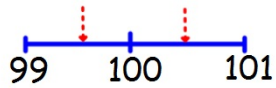


$$6.35 \leq y < 6.45$$

Question 6: Oscar rounds a number,  $y$ , to the nearest integer.

His result is 100

Write down the error interval for  $y$

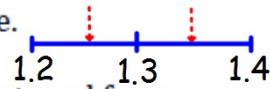


$$99.5 \leq y < 100.5$$

Question 7: A number,  $n$ , is rounded to 1 decimal place.

The result is 1.3

Using inequalities, write down the error interval for  $n$ .

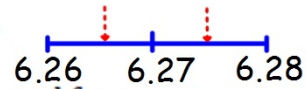


$$1.25 \leq n < 1.35$$

Question 8: A number,  $n$ , is rounded to 2 decimal places.

The result is 6.27

Using inequalities, write down the error interval for  $n$ .

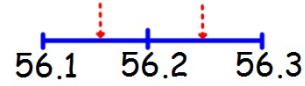


$$6.265 \leq n < 6.275$$

Question 9: Elliott weighs 56.2kg.

This mass,  $m$ , is to the nearest 100g.

Write the error interval due to rounding.



$$56.15\text{kg} \leq m < 56.25\text{kg}$$