

Name.....

Teacher.....

5<sup>th</sup> Year October Assessment 2019

Middle sets

**1 hour**  
**(65 marks)**

Give all answers to 3sf where necessary.  
Show your full working.

Calculators Allowed

1)  $y = \frac{10}{x^2}$

What happens to the value of  $y$  as the value of  $x$  doubles?  
 Circle your answer.

$\times 2$

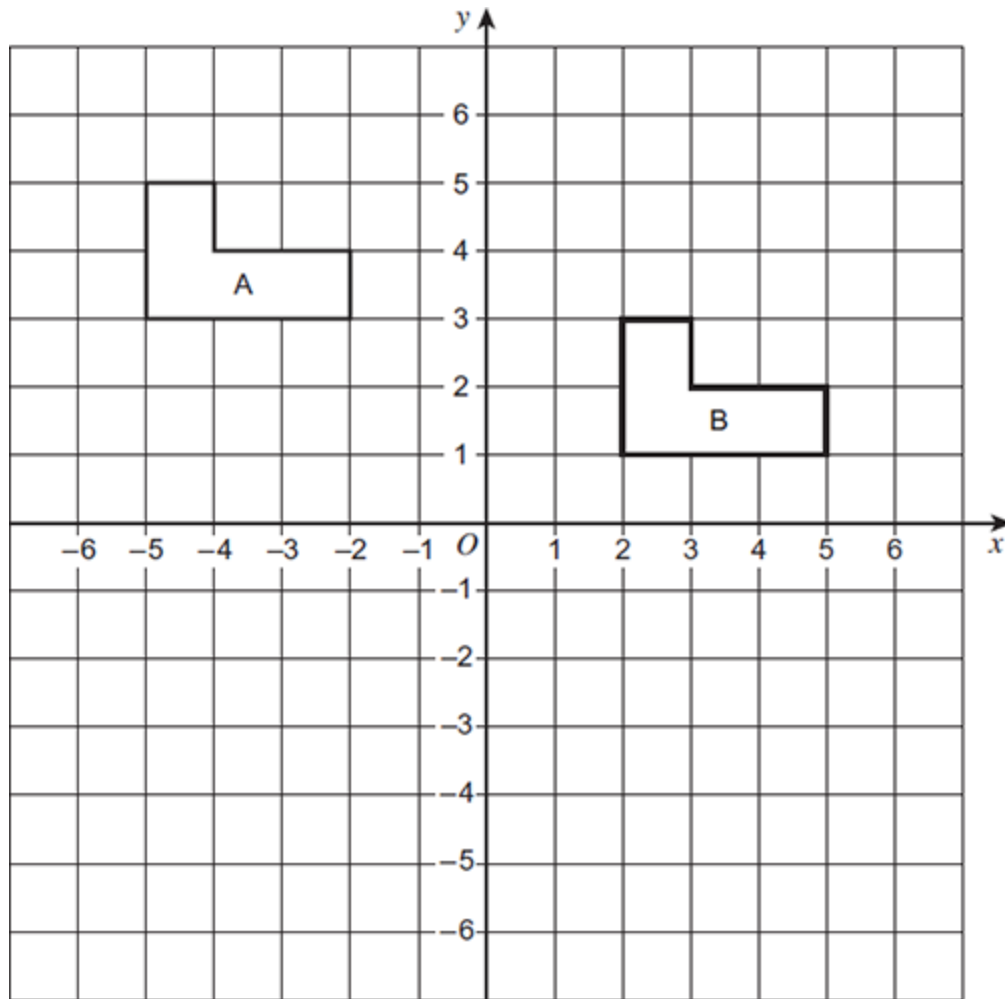
$\div 2$

$\times 4$

$\div 4$

(Total 1 mark)

2)



(a) Describe fully the **single** transformation that maps shape A to shape B.

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(2)

(b) Draw the reflection of shape B in the line  $y = 1$

(2)

(c) Rotate **shape A**  $90^\circ$  anticlockwise about the point (0,2)

(2)

(Total 6 marks)

- 3)  $y$  is directly proportional to  $\sqrt{x}$

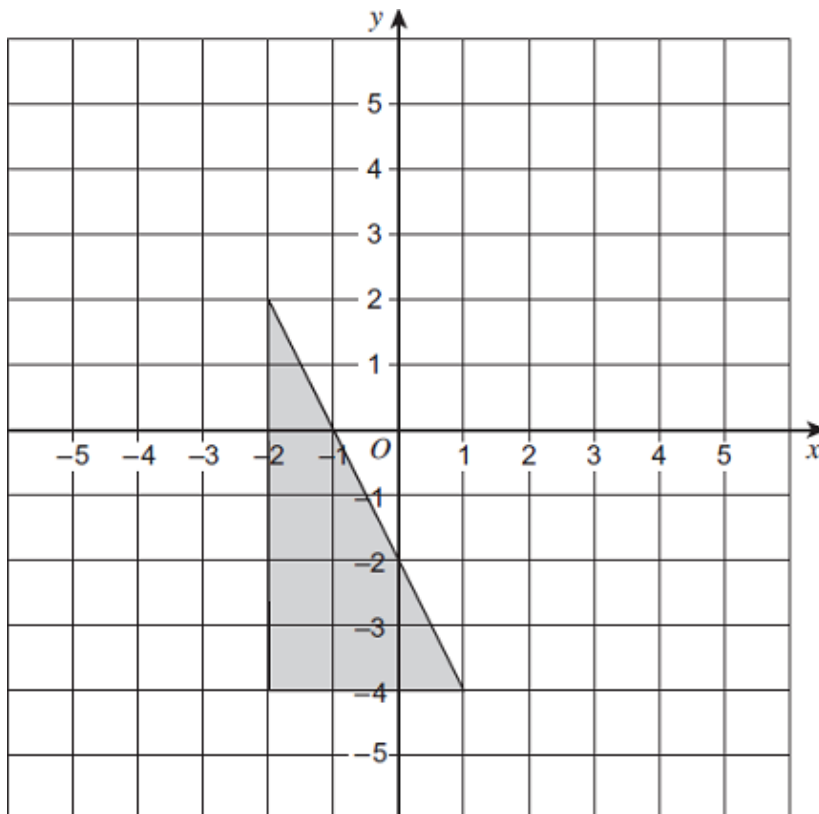
$x$	36	$a$
$y$	2	5

Work out the value of  $a$ .

Answer \_\_\_\_\_

(Total 4 marks)

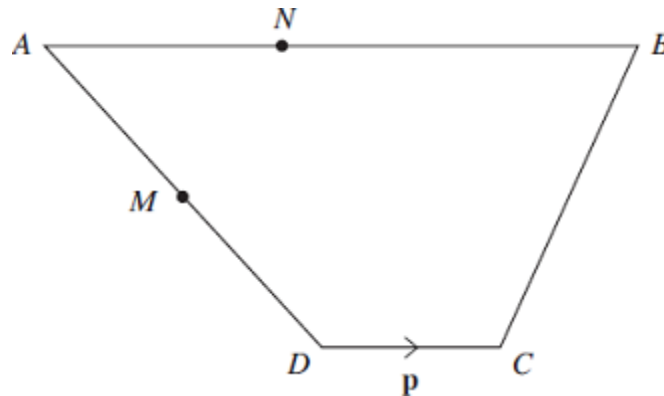
- 4) Enlarge the triangle by scale factor  $-\frac{1}{3}$  with centre  $(1,-1)$ .



(Total 2 marks)

- 5)  $AB$  is parallel to  $DC$ .

Not drawn accurately



$$\vec{AB} = 5\mathbf{p}$$

$$\vec{DC} = \mathbf{p}$$

$$\vec{DA} = 2\mathbf{q} - \mathbf{p}$$

- (a) Show that  $\vec{CB} = 2\mathbf{q} + 3\mathbf{p}$

(1)

- (b)  $M$  is the midpoint of  $AD$ .

$$\vec{AN} : \vec{NB} = 2 : 3$$

Show that  $MN$  is parallel to  $CB$ .

(4)

(Total 5 marks)

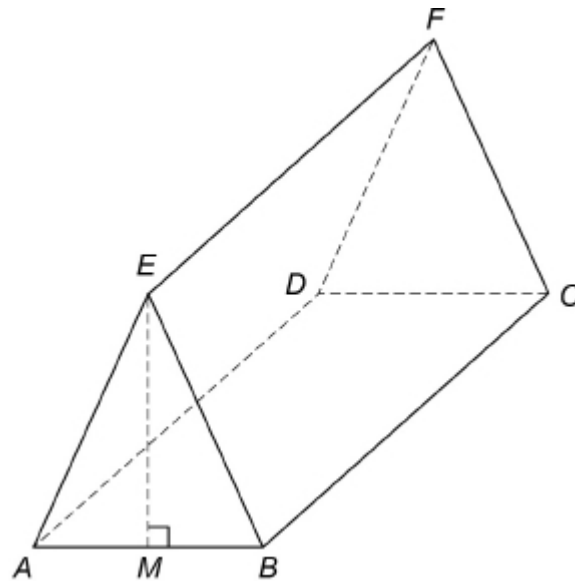
6)

Rectangle  $ABCD$  is the horizontal base of a triangular prism  $ABCDEF$ .

$AE = BE$

$E$  is vertically above  $M$ , the midpoint of  $AB$ .

$AB = 16$  cm     $AE = 17$  cm     $BC = 30$  cm



(a) Show that  $EM = 15$  cm

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(2)

(b) Work out the size of angle  $ECM$ .

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Answer \_\_\_\_\_ degrees

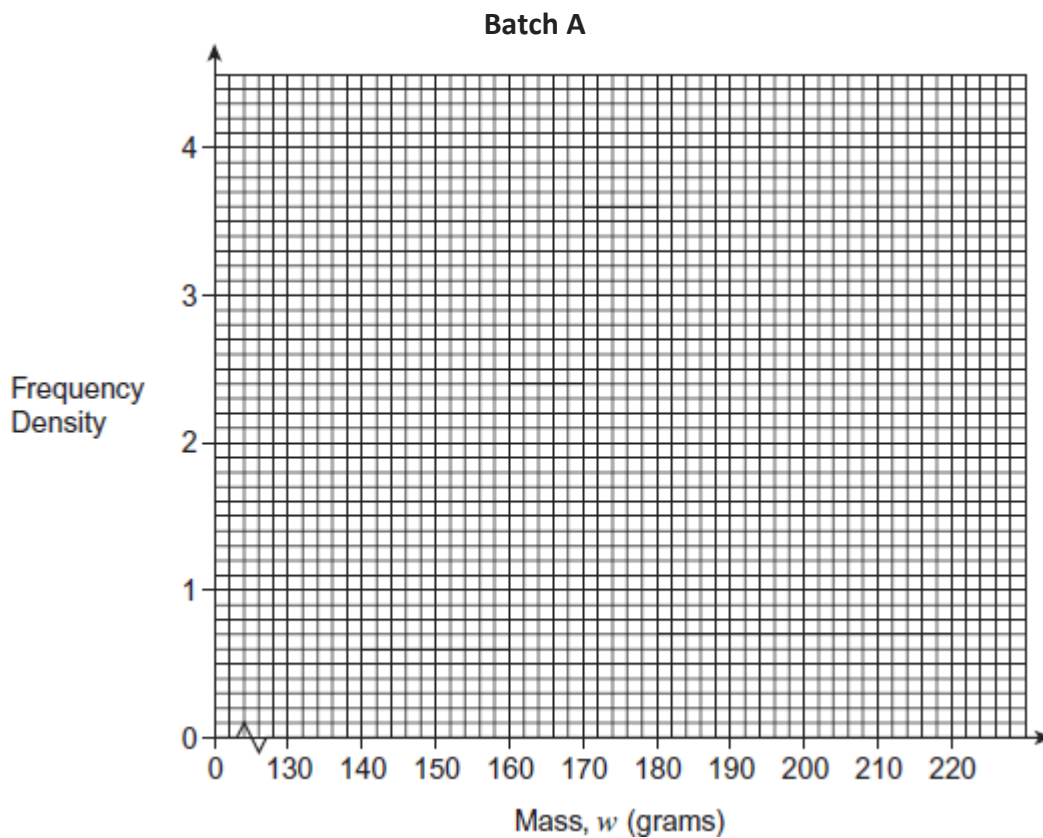
(4)

(Total 6 marks)

7) The table shows information about the masses of 100 oranges in Batch A.

Mass, $w$ (grams)	Frequency
$140 \leq w < 160$	13
$160 \leq w < 170$	40
$170 \leq w < 180$	33
$180 \leq w < 220$	14

(a) Draw a histogram to represent this data.



(3)

(b) Ben states that 20% of the oranges weigh more than 175 g to the nearest gram.

Is his claim correct?

(You must show working to support your answer)

(2)

(Total 5 marks)

- 8) Boat *A* is 7 km north of a port.  
Boat *B* is 5 km east of the same port.  
Boat *A* sails in a straight line towards boat *B*.

Work out the bearing on which boat *A* sails.

\_\_\_\_\_° (4)

- 9) £4000 is invested at 2% compound interest.

Calculate the value of the investment after 3 years.

£ \_\_\_\_\_  
(3)

10) Here are six cards.



Two cards are picked at random.

(a) Assume that the first card chosen is not replaced.

Work out the probability that both cards are B.

Answer \_\_\_\_\_

(3)

(b) In fact the first card was replaced.

How does this affect the answer to part (a)?

Tick a box

Show working to support your answer.

Probability is now bigger

Probability stays the same

Probability is now smaller

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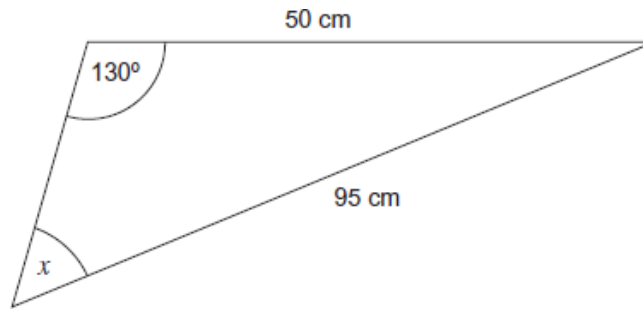
(2)

(Total 5 marks)



11) (a) Work out the size of angle  $x$ .

Not drawn accurately

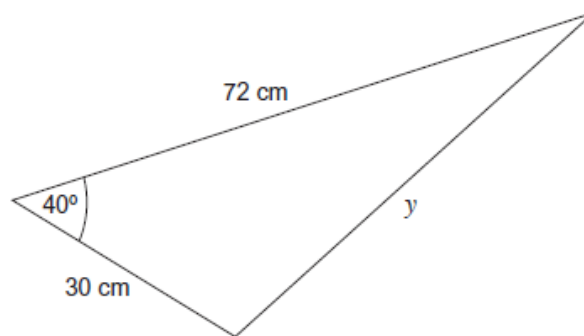


Answer \_\_\_\_\_ degrees

(3)

(b) Work out the length  $y$ .

Not drawn accurately



Answer \_\_\_\_\_ cm

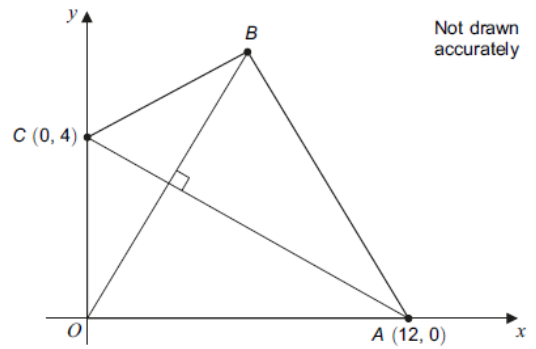
(3)

(Total 6 marks)

12)

$OABC$  is a kite.

(a) Work out the equation of  $AC$ .



Answer \_\_\_\_\_ (2)

(b) Calculate the area of the kite

Answer \_\_\_\_\_  $\text{cm}^2$

(2)

(Total 4 marks)

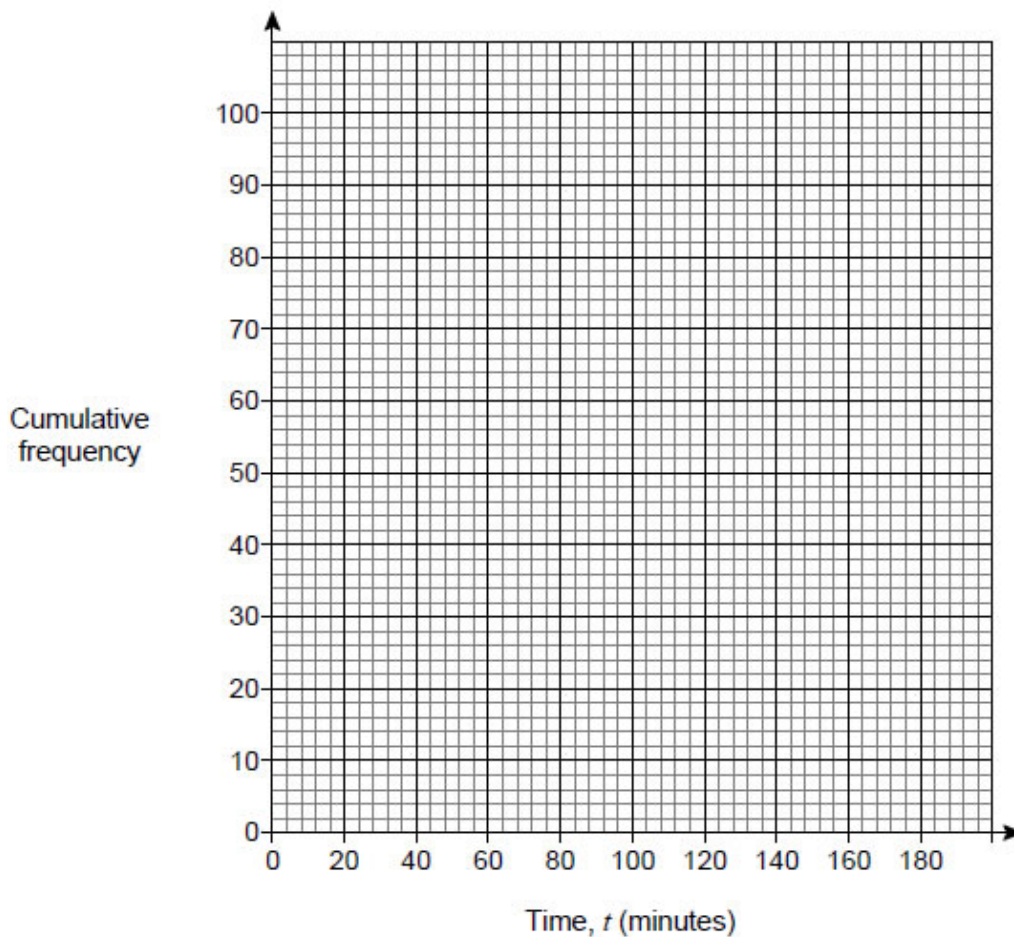
13)

The table shows the running times of some films.

(a) Draw a cumulative frequency graph on the grid below to represent the data.

(3)

Time, $t$ (minutes)	Number of films	
$0 \leq t < 80$	0	
$80 \leq t < 100$	8	
$100 \leq t < 120$	30	
$120 \leq t < 140$	34	
$140 \leq t < 160$	19	
$160 \leq t < 180$	9	



(b) Estimate the number of these films with a running time of less than 2 ½ hours.

Answer \_\_\_\_\_

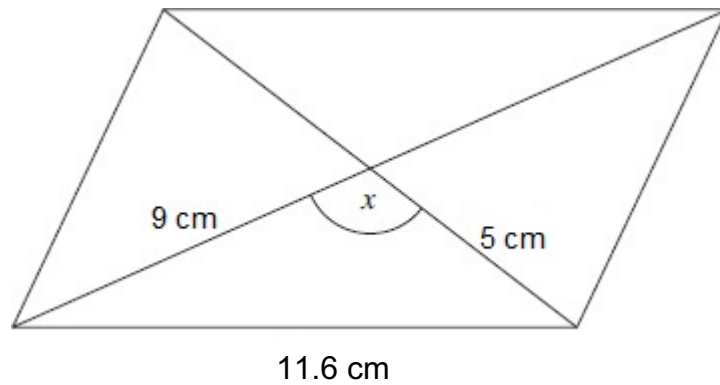
(1)

(Total 4 marks)

14)

The diagram shows a parallelogram.

Not drawn accurately



(a) Work out the size of angle  $x$ .

Answer \_\_\_\_\_ degrees

(3)

(b) Work out the area of the parallelogram.

Answer \_\_\_\_\_  $\text{cm}^2$

(3)

(Total 6 marks)

**15)** The ages of Adam, Ben and Caleb are in the ratio 5:7:11.

Next year, they will be in the ratio 8:11:17. How old are they all now?

Adam \_\_\_\_\_ years      Ben \_\_\_\_\_ years      Caleb \_\_\_\_\_ years

**(4 marks)**

**END OF QUESTION PAPER**

**Now check your working carefully**