Name……

Teacher……

4th Year Summer Assessment

Paper 2 (alpha sets)

1 Hour

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

Calculators Allowed

(Total 60 marks)

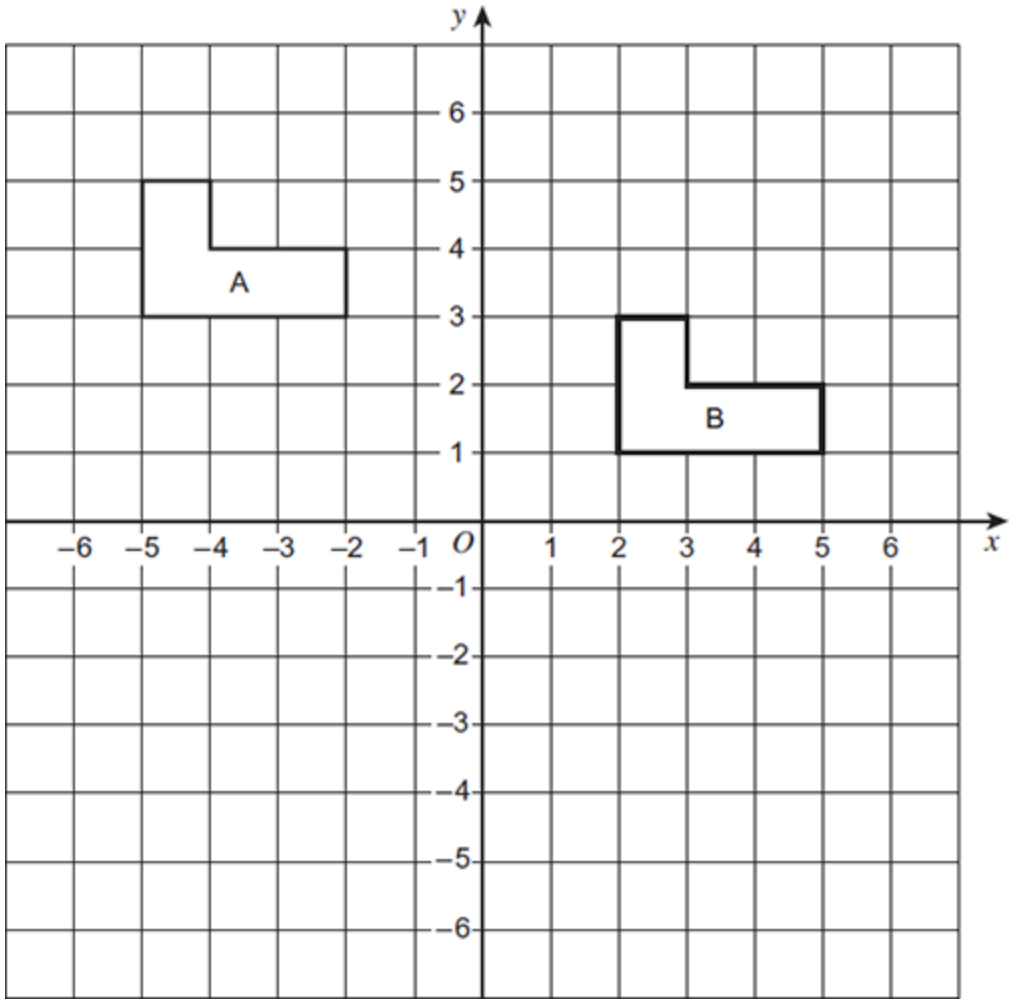
1) $y = \frac{10}{x^2}$

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

× 2 ÷ 2 × 4 ÷ 4

(Total 1 mark)

2)



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

_____

_____

(2)

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

(2)

(Total 4 marks)

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

x	36	*a*
y	2	5

Work out the value of *a*.

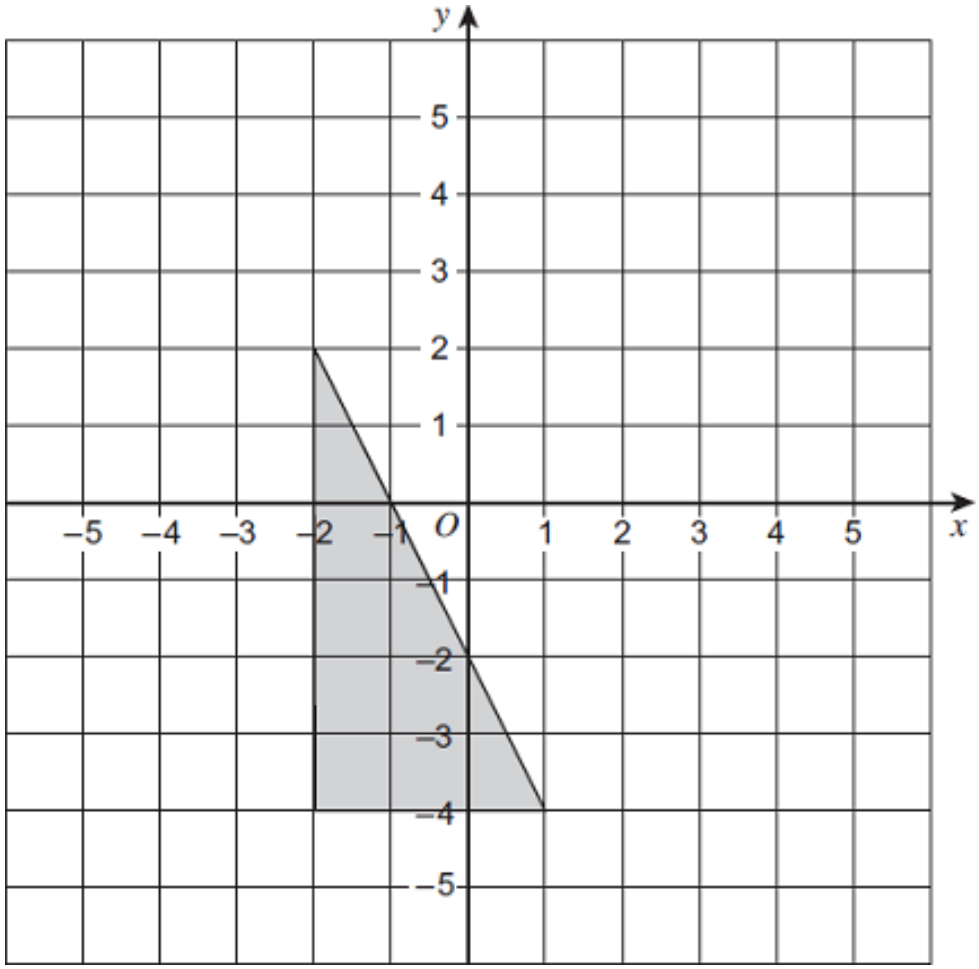
Answer _____

(Total 4 marks)

4) Convert $0.2\dot{8}$ to a fraction.
Give your answer in its simplest form.

(Total 3 marks)

5) Enlarge the triangle by scale factor $\frac{1}{3}$ with centre (−5, −4).



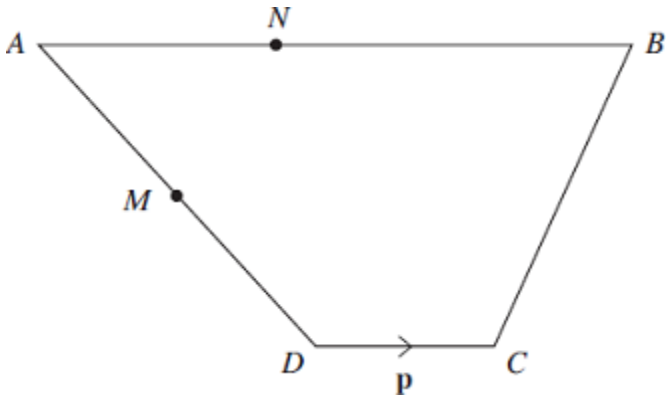
(Total 2 marks)

6) Factorise $3x^2 + 14x + 8$

(Total 2 marks)

7) *AB* is parallel to *DC*.

Not drawn accurately



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

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

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

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

(1)

(b) *M* is the midpoint of *AD*.

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

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

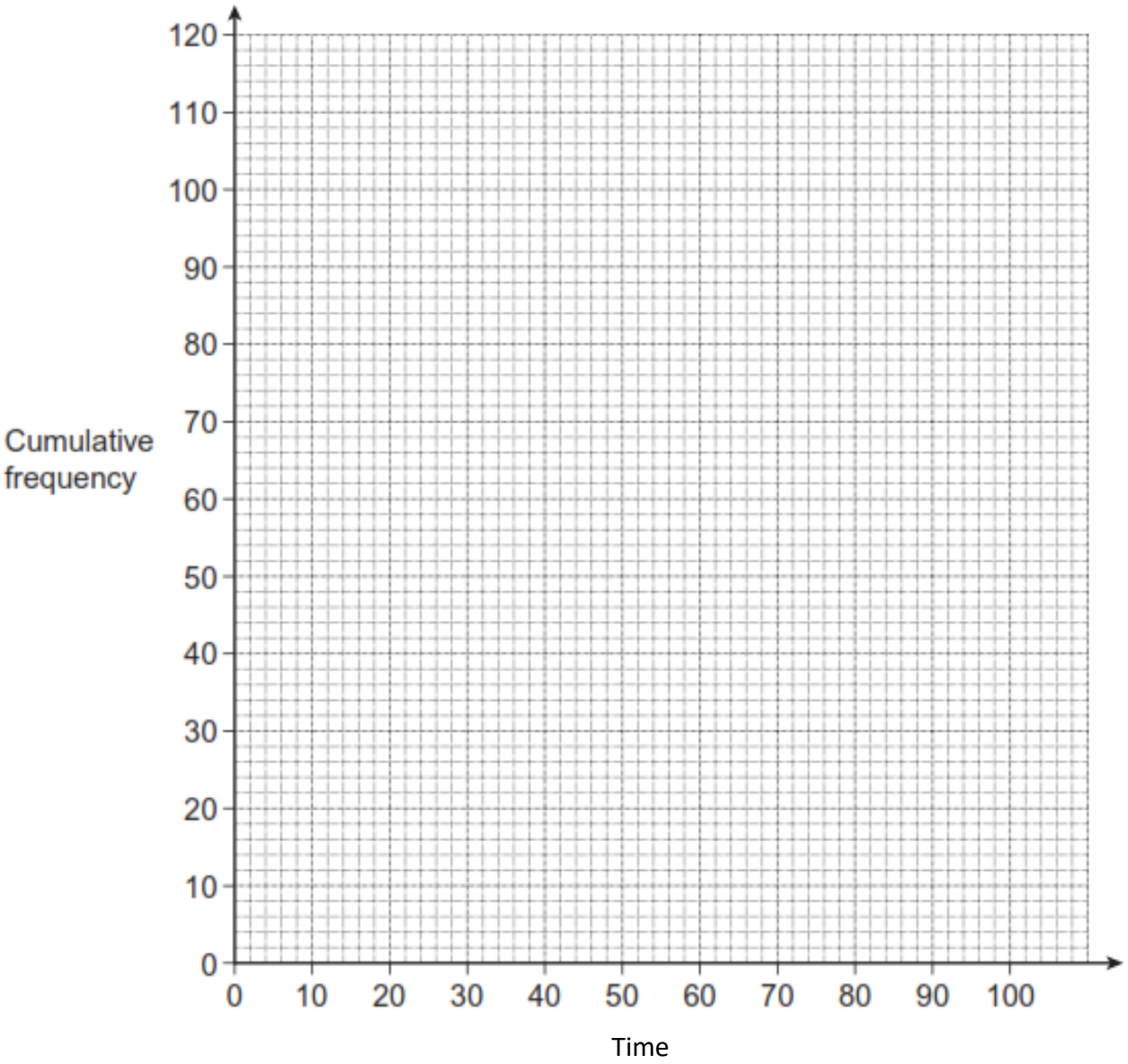
(4)

(Total 5 marks)

8) The table shows a summary of the times(t) in seconds to complete a task for 110 boys

Time	Frequency
$10 < t \leq 20$	12
$20 < t \leq 40$	8
$40 < t \leq 60$	42
$60 < t \leq 80$	29
$80 < t \leq 100$	19

(a) Find the interquartile range of times by first drawing a cumulative frequency diagram



Answer _____

(5)

(b) 80 girls also carried out the task, the data for their times taken is summarised below:

median = 42 seconds IQR = 55 seconds

Compare the boys and girls times stating any values you use:

Comparison 1

Comparison 2

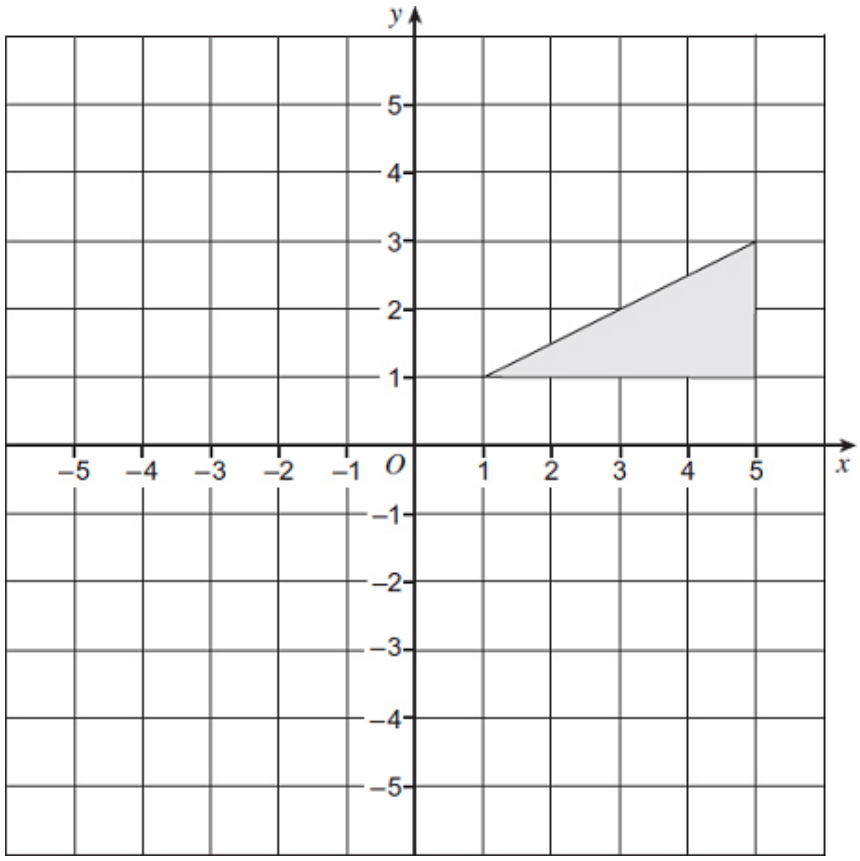
(4)

(ii) 2 boys are chosen at random, find the probability that they both take over 70 minutes

(4)

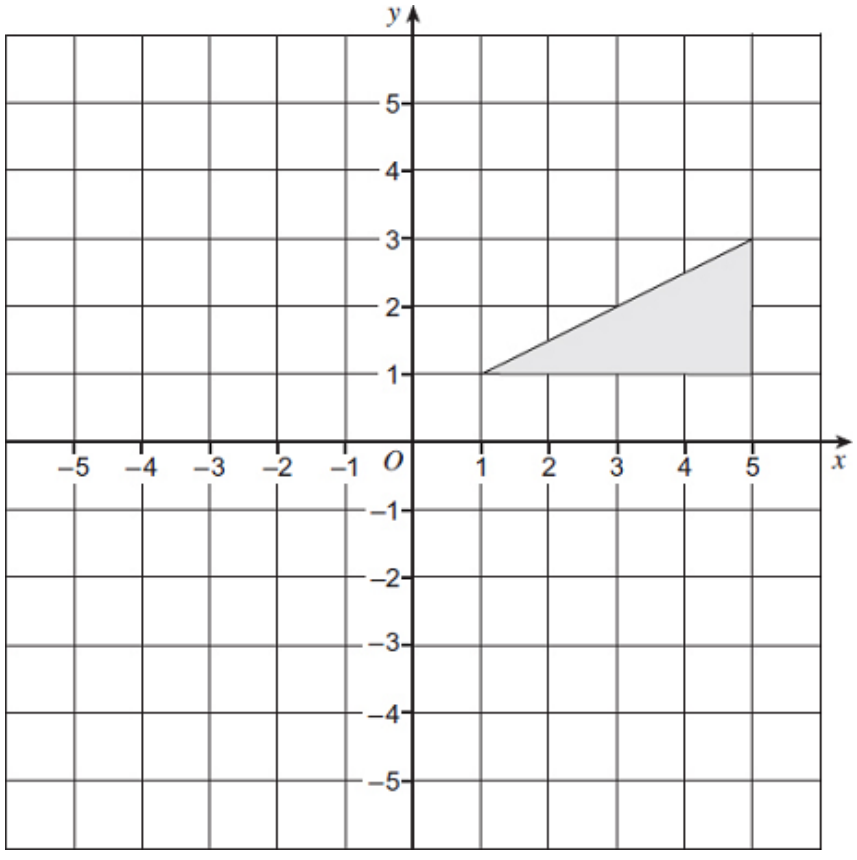
(Total 13 marks)

9) (a) Reflect the triangle in the line $x = 1$



(2)

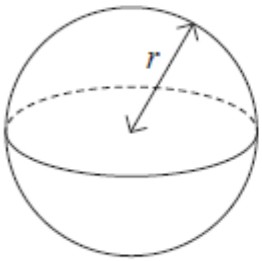
(b) Rotate the triangle through 180° about the origin.

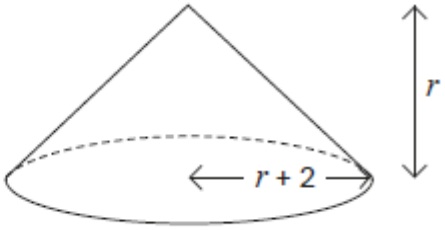


(2)

(Total 4 marks)

10) The volume of the sphere is equal to the volume of the cone.





Work out the value of r.
Do **not** use trial and improvement.
You **must** show your working.

(Total 5 marks)

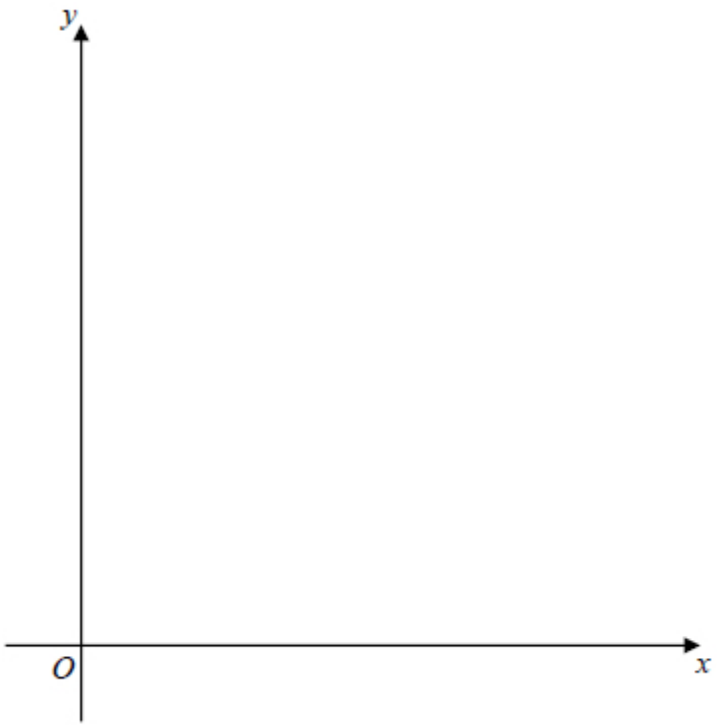
11) y is inversely proportional to x for positive values.
When $x = 3.5$, $y = 4.2$

(a) Work out the value of y when $x = 5.6$

Answer _____

(3)

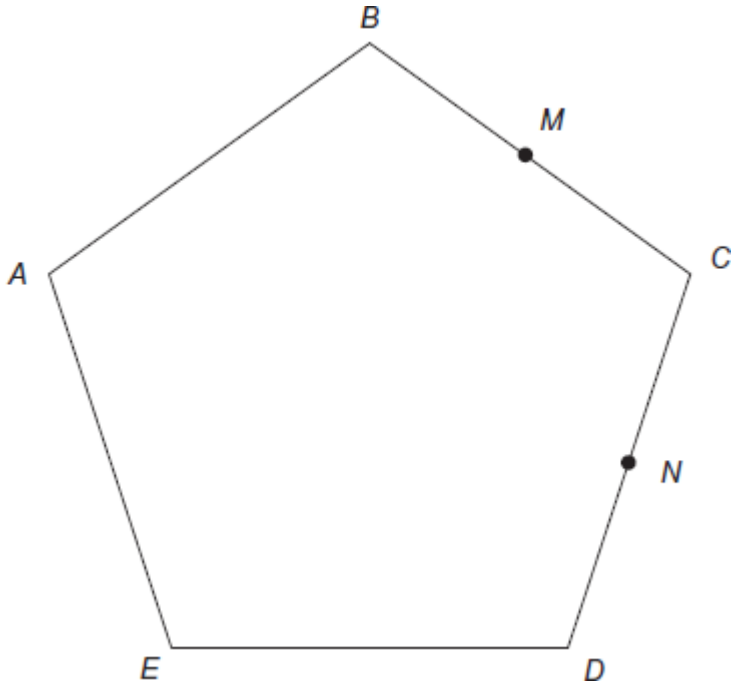
(b) On the grid draw a sketch to show the relationship between y and x.



(1)

(Total 4 marks)

12) *ABCDE* is a pentagon.
M is the midpoint of *BC*.
N is the midpoint of *CD*.



$\overrightarrow{BC} = x$

$\overrightarrow{CD} = y$

(a) Show that *MN* is parallel to *BD*.

(3)

(b) Write down the ratio *BD* : *MN* in its simplest form.

Answer _____ : _____

(1)

(Total 4 marks

13) ABCD is a triangle and B is a point on AC.
AB = 8cm and BC = 6cm.
Angle BCD = 48° and angle BDC = 50°.

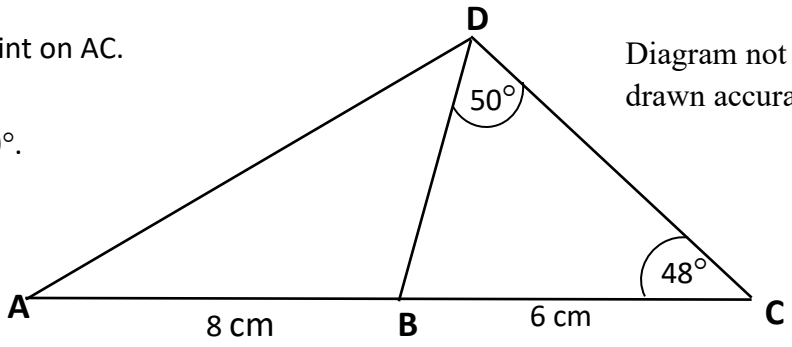


Diagram not drawn accurately

(a) Find the length of BD

BD = _____cm

(3)

(b) Find the length of AD

AD = _____cm

(3)

(c) Find the area of triangle ABD

AD = _____cm^2

(3)

(Total 9 marks)

END OF QUESTION PAPER