

8 The points  $A$  and  $B$  have coordinates  $(1, 7)$  and  $(13, 1)$  respectively.

(a) Find the exact length of  $AB$ .

(2)

The point  $C$  divides  $AB$  in the ratio  $1:2$

(b) Find the coordinates of  $C$ .

(2)

The line  $l$  passes through  $C$  and is perpendicular to  $AB$ .

(c) Find an equation of  $l$ , giving your answer in the form  $y = ax + b$  where  $a$  and  $b$  are integers.

(4)

The point  $D$  with coordinates  $(9, d)$  lies on  $l$ .

(d) Find the value of  $d$ .

(1)

The point  $E$  is the midpoint of  $CD$ .

(e) Find the exact value of the area of the quadrilateral  $ADBE$ .

(5)

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**Question 8 continued**

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**Question 8 continued****(Total for Question 8 is 14 marks)**

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