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)

Question 8 continued

Question 8 continued

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Question 8 continued

(Total for Question 8 is 14 marks)