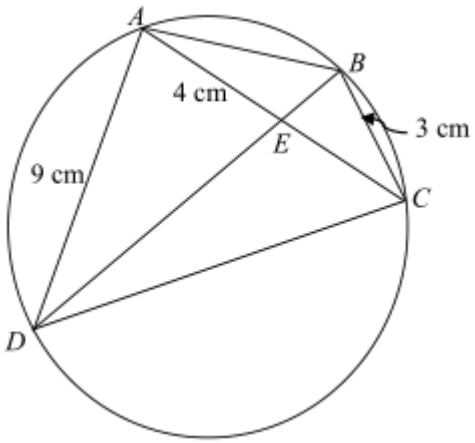
E Math

1. [**AHS 16 (modified)**]
In the diagram below, A, B, C and D are point son the circumference of the circle. AEC and DEB are straight lines.



It is also given that $AE = 4$ cm, $BC = 3$ cm and $AD = 9$ cm.

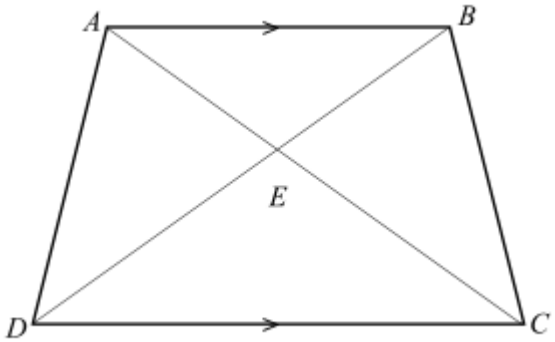
(a) Show that triangles AED and BEC are similar. [2]

(b) Find the length of BE. [2]

(c) Find the ratio of the area of triangle AED to the area of triangle BEC. [1]

(d) Find the ratio of the area of triangle AED to the area of triangle ABD. [1]

2. [**FSS 16**]
The diagram shows a trapezium $ABCD$ where $AB = 8$ cm and $CD = 12$ cm.
The diagonals AC and BD meet at E.

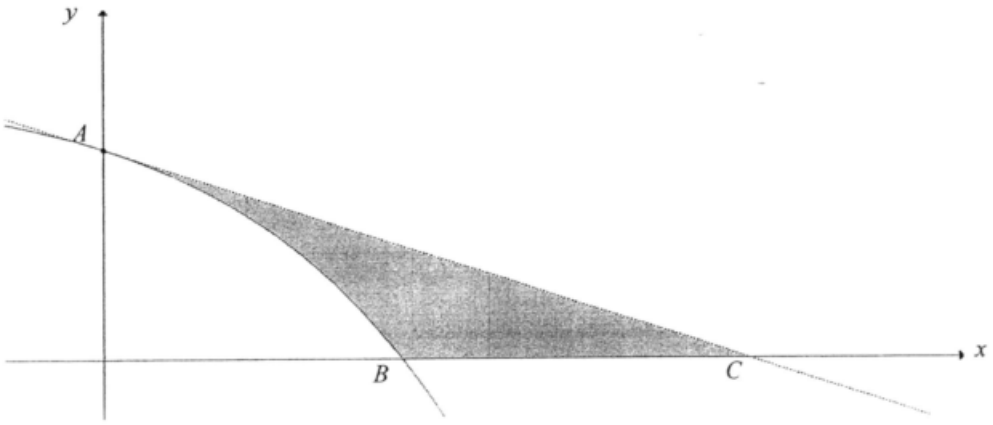


(a) Show that $\triangle ABE$ and $\triangle CDE$ are similar. [2]

(b) Given that the area of $\triangle CDE$ is 36 cm^2, find the area of the trapezium $ABCD$. [2]

A Math

3. **[CHS 15]**
The diagram shows part of the curve $y = 4 - e^{\frac{1}{2}x}$ which cuts the axes at A and at B.



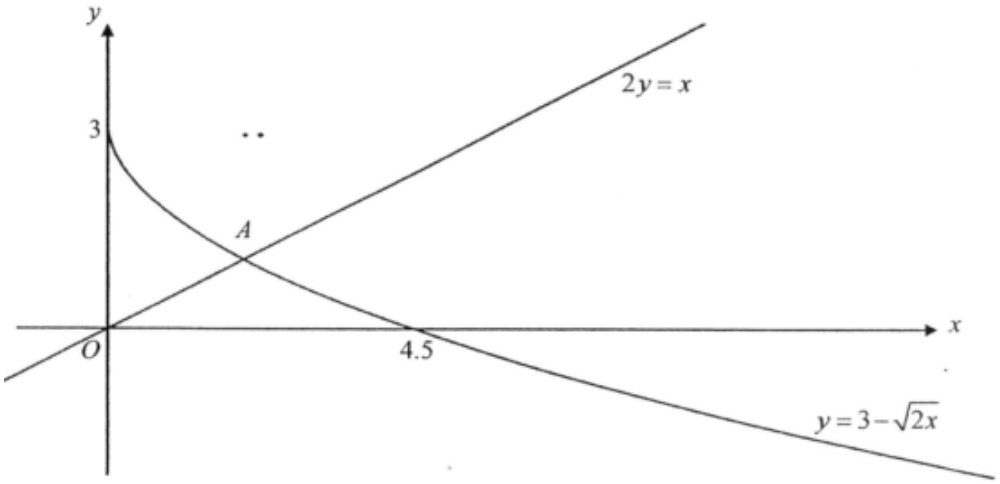
(a) Find the coordinates of A and of B. [4]

The tangent to the curve at A meets the x-axis at C.

(b) Find the coordinates of C. [4]

(c) Find the area of the shaded region. [4]

4. **[NYGH 15]**
The diagram shows parts of the curve $y = 3 - \sqrt{2x}$ and the line $2y = x$.
The curve and the line intersect at the point A.



(a) Show that the area bounded by the curve $y = 3 - \sqrt{2x}$, the x-axis and the lines $x = 4.5$ and $x = 0$ can be expressed as $(a\sqrt{2} + b)$ square units, where a and b are constants. [4]

(b) Find the coordinates of A. [2]

(c) Find the area bounded by the straight line $2y = x$, the curve $y = 3 - \sqrt{2x}$ and the y-axis. [3]

Answers

1. (b) $BE = 1\frac{1}{3}$ cm.

   (c) $1 : 9$.

   (d) $3 : 4$.

2. 100.

3. (a) $A(0, 3)$, $B(4 \ln 2, 0)$.

   (b) $C(6, 0)$.

   (c) 3.91 units^2.

4. (a) $18\sqrt{2} - \frac{45}{2}$.

   (b) $A(2, 1)$.

   (c) $\frac{7}{3}$.