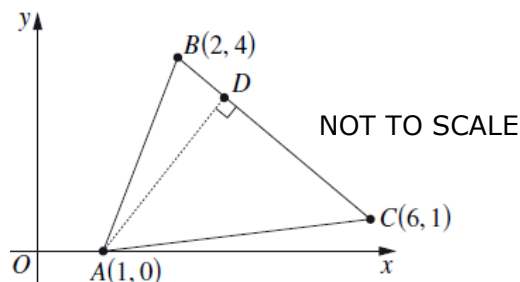




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- 2016 12** The diagram shows points $A(1, 0)$, $B(2, 4)$ and $C(6, 1)$. The point D lies on BC such that $AD \perp BC$.
- Show that the equation of BC is $3x + 4y - 22 = 0$.
 - Find the length of AD .
 - Hence, or otherwise, find the area of $\triangle ABC$.



$$\begin{aligned} \text{(i) } \text{grad } BC &= \frac{4-1}{2-6} \\ &= -\frac{3}{4} \end{aligned}$$

Using $(2, 4)$ and $m = -\frac{3}{4}$:

$$y - 4 = -\frac{3}{4}(x - 2)$$

$$4y - 16 = -3x + 6$$

$$3x + 4y - 22 = 0$$

State Mean:

1.89

(ii) Using $(1, 0)$ and $3x + 4y - 22 = 0$:

$$d = \frac{|3(1) + 4(0) - 22|}{\sqrt{3^2 + 4^2}}$$

$$= \frac{|-19|}{5}$$

$$= \frac{19}{5}$$

\therefore the length of AD is $\frac{19}{5}$ units.

State Mean:

1.71

$$\begin{aligned} \text{(iii) } \text{Length } BC &= \sqrt{(6-2)^2 + (1-4)^2} \\ &= \sqrt{25} \\ &= 5 \end{aligned}$$

$$\therefore \text{Area} = \frac{1}{2} \times 5 \times \frac{19}{5}$$

$$= 9\frac{1}{2}$$

\therefore the area is $9\frac{1}{2}$ units².

State Mean:

1.70

* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by BOSTES.

BOSTES: Notes from the Marking Centre

This information is released by BOSTES in late Term 1 2017.