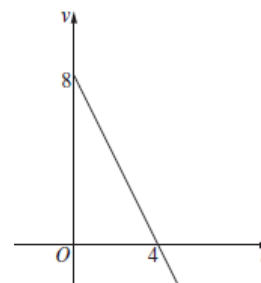




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- 2015 9** A particle is moving along the x -axis. The graph shows its velocity v metres per second at time t seconds.
When $t = 0$ the displacement x is equal to 2 metres.
What is the maximum value of the displacement x ?

- (A) 8 m (B) 14 m
(C) 16 m (D) 18 m

**1****D**

Maximum displacement when $v = 0$.

Distance travelled = area of triangle

$$= \frac{1}{2} \times 4 \times 8$$

$$= 16$$

$$\text{Displacement} = 2 + 16$$

$$= 18$$

\therefore the maximum value of x is 18 m.

Alternative method:

The graph has gradient of -2 and v -intercept of 8 .

$$\therefore v = -2t + 8.$$

$$\text{Now, } x = -t^2 + 8t + c$$

Subs $t = 0, x = 2$:

$$2 = -(0)^2 + 8(0) + c$$

$$\therefore c = 2$$

$$x = -t^2 + 8t + 2$$

Subs $t = 4$:

$$x = -(4)^2 + 8(4) + 2$$

$$= 18$$

\therefore the displacement is 18 m.

State Mean:

0.31

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