Position (x) of an object is related to time (t) as $x = t^3 - 12t$ where (x) is in metre and (t) in second. Find the acceleration of the object when its velocity is zero.

$$x = t^3 - 12t$$

$$v = \frac{dx}{dt} = \frac{d}{dt}(t^3 - 12t)$$

$$= \frac{d}{dt}t^3 - \frac{d}{dt}12t$$

$$= 3t^2 - 12$$

$$a = \frac{dv}{dt} = \frac{d}{dt}(3t^2 - 12)$$

$$= \frac{d}{dt}3t^2 - \frac{d}{dt}(12)$$

$$= 6t$$

$6t = 0$
$a = 6t$
substituting $t = 2$
$$a = 6 \times 2$$
$$= 12 \, ms^{-2}$$