A car is travelling with uniform acceleration along a straight road. The road has marker posts every 200m. When the car passed one post, it has a speed of 10ms-2 and when it passes the next one, its speed is 20ms-2. What is the car's acceleration?

$v_1 = 10\frac{m}{s}$ - initial speed

$v_2 = 20\frac{m}{s}$ - final speed

$d = 200\ m$ - distance

Equation for speed:

$v_2 = v_1 + a * t$ $\qquad$ => $\qquad$ $t = \frac{v_2 - v_1}{a}$ – time of motion

Equation for distance:

$S = \frac{v_1 + v_2}{2}t$

Substitute t:

$S = \frac{v_2^2 - v_1^2}{2a}$

Therefore:

$a = \frac{v_2^2 - v_1^2}{2S} = \frac{20^2 - 10^2}{2*200} = \frac{300}{400} = 0.75\ m/s^2$

Answer: $a = 0.75\ m/s^2$