A race car has a mass of 833 kg. It accelerates uniformly from rest, and travels 48.9 m in 3.13 s. Find the acceleration of the car.

Solution.

$$m = 833kg, s = 48.9m, t = 3.13s;$$

$$a - ?$$

Displacement is:

$$s = v_0 t + \frac{at^2}{2}.$$

$v_0 = 0$, because car accelerates from rest.

$$s = \frac{at^2}{2};$$

$$a = \frac{2s}{t^2};$$

$$a = \frac{2 \cdot 48.9}{3.13^2} = 9.98 \approx 10 \left(\frac{m}{s^2}\right).$$

Answer: $a = 10 \left(\frac{m}{s^2}\right)$.