

Quiz 3b

Note Title

27/09/2012

1) An NFL caliber wide receiver can reach a top speed of 10.0 m/s in only 2.4 s.
What is their acceleration during this time?

2) A car traveling at 32 km/h accelerates to 54 km/h at a rate of 1.8 m/s^2 . How long does it take to reach their top speed?

1.) $a = ?$

$$\Delta v = v - v_0 = 10.0 \text{ m/s}$$

$$t = 2.4 \text{ s}$$

$$a = \frac{\Delta v}{t} = \frac{10.0 \text{ m/s}}{2.4 \text{ s}} = \boxed{4.2 \text{ m/s}^2}$$

2.) $a = 1.8 \text{ m/s}^2$

$$\Delta v = 15 \text{ m/s} - 8.889 \text{ m/s} \\ = 6.111 \text{ m/s}$$

$$t = ?$$

* must convert $\text{km/h} \rightarrow \text{m/s}$

$$32 \text{ km/h} \div 3.6 = 8.889 \text{ m/s}$$

$$54 \text{ km/h} \div 3.6 = 15 \text{ m/s}$$

$$a = \frac{\Delta v}{t} \quad \frac{dt}{da} = \frac{\Delta v}{a}$$

$$t = \frac{\Delta v}{a} = \frac{6.111 \text{ m/s}}{1.8 \text{ m/s}^2} = \boxed{3.4 \text{ s}}$$