

AST12 1050

1. Driving in another country, you notice the speed limit is 30 m s^{-1} . What is the speed limit in miles per hour?

$$V = 30 \frac{\text{m}}{\text{s}} \times \frac{60 \text{ s}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{3.1 \text{ miles}}{5000 \text{ m}}$$

$$\boxed{V = 67.0 \text{ miles per hour}}$$

2. $H_0 = 72 \text{ km s}^{-1} \text{ Mpc}^{-1}$.

Find H_0 in yr^{-1} .

$$H_0 = 72 \frac{\text{km}}{\text{s Mpc}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ Mpc}}{10^6 \text{ pc}} \times \frac{1 \text{ pc}}{3.09 \times 10^{16} \text{ m}} \times \frac{60 \text{ s}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{365 \text{ day}}{1 \text{ yr}}$$

$$H_0 = 7.35 \times 10^{-11} \text{ yr}^{-1}$$