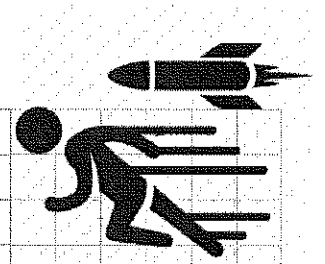


# SOLUTIONS

## VELOCITY

$$V = d/t; \text{ rearrange as needed, } d = Vt, t = d/V$$

Perform the following calculations. Show the work as demonstrated in class.  
Use conversion factors from the time and length worksheets.



1. 30 ft in 6 s; Calculate velocity in fps

$$V = \frac{d}{t} = \frac{30 \text{ FT}}{6 \text{ s}} = 5 \text{ FT/s}$$

2. 200 m in 600 s; Calculate velocity in m/s

$$V = \frac{d}{t} = \frac{200 \text{ m}}{600 \text{ s}} = 0.333 \text{ m/s}$$

3. 400 ft in 60 s; Calculate velocity in ft/min

$$V = \frac{d}{t} = \frac{400 \text{ FT}}{60 \text{ s} \left( \frac{1 \text{ MIN}}{60 \text{ s}} \right)} = 400 \text{ FT/MIN}$$

4. 1200 m in 1 hr; Calculate velocity in m/min

$$V = \frac{d}{t} = \frac{1200 \text{ m}}{1 \text{ HR} \left( \frac{60 \text{ MIN}}{1 \text{ HR}} \right)} = 20 \text{ m/MIN}$$

5. 176 ft in 2 s; Calculate velocity in mph

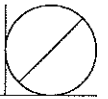
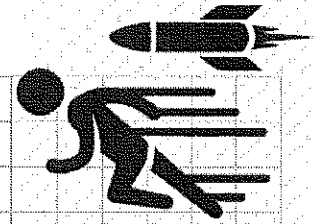
$$V = \frac{d}{t} = \frac{176 \text{ FT}}{2 \text{ s}} \left( \frac{1 \text{ MI}}{5280 \text{ FT}} \right) \left( \frac{3600 \text{ s}}{1 \text{ HR}} \right) = 60 \frac{\text{ MI}}{\text{ HR}}$$

6. 30 REV in 3 MIN; Calculate velocity in RPM

$$V = \frac{d}{t} = \frac{30 \text{ REV}}{3 \text{ MIN}} = 10 \frac{\text{ REV}}{\text{ MIN}}$$

7. 345 DEG in 0.75 MIN, Calculate velocity in RPM (360 DEG = 1 REV)

$$V = \frac{d}{t} = \frac{345 \text{ DEG}}{0.75 \text{ MIN}} \left( \frac{1 \text{ REV}}{360 \text{ DEG}} \right) = 1.28 \frac{\text{ REV}}{\text{ MIN}}$$

VELOCITY

8. 16 RAD in 4 s; Calculate velocity in RAD/s

$$V = \frac{d}{t} = \frac{16 \text{ RAD}}{4 \text{ s}} = 4 \text{ RAD/s}$$

9. 30 RAD in 5 s; Calculate velocity in RPM (2 PI RAD = 6.283 RAD = 1 REV = 360 DEG)

$$V = \frac{d}{t} = \frac{30 \text{ RAD}}{5 \text{ s}} \left( \frac{1 \text{ REV}}{2\pi \text{ RAD}} \right) \left( \frac{60 \text{ s}}{1 \text{ MIN}} \right) = 57.3 \frac{\text{REV}}{\text{MIN}}$$

10. 60 MPH for 1 hr; Calculate distance in miles (mi)

$$d = Vt = \left( \frac{60 \text{ MI}}{\text{HR}} \right) \left( \frac{1 \text{ HR}}{1} \right) = 60 \text{ MI}$$

11. 50 MPH for 2 hr; Calculate distance in ft

$$d = Vt = \left( \frac{50 \text{ MI}}{\text{HR}} \right) \left( \frac{2 \text{ HR}}{1} \right) = 100 \text{ MI}$$

12. 300 ft at 10 FPS(ft/s); Calculate time in s

$$t = \frac{d}{v} = \frac{300 \text{ FT}}{10 \frac{\text{FT}}{\text{S}}} = 30 \text{ s}$$

13. 700 m at 2 FPS; Calculate time in min

$$t = \frac{d}{v} = \frac{700 \text{ M}}{2 \frac{\text{FT}}{\text{S}}} \left( \frac{1 \text{ FT}}{3.048 \text{ M}} \right) \left( \frac{1 \text{ MIN}}{60 \text{ S}} \right) = 19.14 \text{ MIN}$$

14. 600 RPM; Calculate velocity in rad/s

$$600 \frac{\text{REV}}{\text{MIN}} \left( \frac{2\pi \text{ RAD}}{1 \text{ REV}} \right) \left( \frac{1 \text{ MIN}}{60 \text{ S}} \right) = 62.8 \frac{\text{RAD}}{\text{S}}$$

ALT. 
$$\frac{700 \text{ M}}{1} \div \frac{2 \text{ FT}}{\text{S}} = 350 \frac{\text{M} \cdot \text{S}}{\text{FT}} \left( \frac{1 \text{ FT}}{3.048 \text{ M}} \right) \left( \frac{1 \text{ MIN}}{60 \text{ S}} \right) =$$