

Name SOLUTIONS

Date _____

Kinematic Practice 2

$$d = vt \quad v_f = v_i + at$$

1) An object is moving at 25 mph for 50 minutes. How far does it go?

$$V = 25 \text{ mph}$$

$$t = 50 \text{ min}$$

$$d = ?$$

$$t = 50 \text{ min} \times \frac{1 \text{ hour}}{60 \text{ min}}$$

$$t = \frac{50}{60} = .83 \text{ hours}$$

$$d = vt$$

$$d = (25)(.83)$$

$$d = \boxed{20.75 \text{ MILES}}$$

2) What is the final speed if an object moving at 40 m/s accelerates at 12 m/s² for 2.3 s?

$$V_f = ?$$

$$V_i = 40 \text{ m/s}$$

$$a = 12 \text{ m/s}^2$$

$$t = 2.3 \text{ s}$$

$$V_f = V_i + at$$

$$V_f = 40 + (12)(2.3)$$

$$V_f = 40 + 27.6$$

$$V_f = \boxed{67.6 \text{ m/s}}$$

3) What is the acceleration if an object goes from 10 m/s to 40 m/s in 4.8 s?

$$a = ?$$

$$V_i = 10 \text{ m/s}$$

$$V_f = 40 \text{ m/s}$$

$$t = 4.8 \text{ s}$$

$$V_f = V_i + at$$

$$40 = 10 + a(4.8)$$

$$40 - 10 = a(4.8)$$

$$30 = a(4.8)$$

$$\frac{30}{4.8} = a = \boxed{6.25 \text{ m/s}^2}$$

4) How far does an object travel if it moves at 5 m/s for 3.5 minutes?

$$d = ?$$

$$V = 5 \text{ m/s}$$

$$t = 3.5 \text{ min}$$

$$t = 3.5 \text{ min} \times \frac{60 \text{ s}}{\text{min}}$$

$$t = 210 \text{ s}$$

$$d = vt$$

$$d = (5)(210)$$

$$d = \boxed{1,050 \text{ m}}$$

5) An object starts at rest. It accelerates at 5 m/s^2 for 7 seconds. How far has it gone?

$$v_i = 0 \frac{\text{m}}{\text{s}}$$

$$a = 5 \frac{\text{m}}{\text{s}^2}$$

$$t = 7 \text{ s}$$

$$d = ?$$

AVERAGE \rightarrow

$$v = \frac{v_i + v_f}{2}$$

$$v = \frac{0 + 35}{2}$$

$$v = \underline{\underline{17.5 \frac{\text{m}}{\text{s}}}}$$

$$d = v t$$

$$d = (17.5)(7)$$

$$d = \boxed{122.5 \text{ m}}$$

$$v_f = v_i + a t$$

$$v_f = 0 + (5)(7)$$

$$\underline{\underline{v_f = 35 \frac{\text{m}}{\text{s}}}}$$

6) An object accelerates as it travels 300 m in 5 s. Its final speed was 90 m/s. What was the initial speed?

$$d = 300 \text{ m}$$

$$t = 5 \text{ s}$$

$$v_f = 90 \frac{\text{m}}{\text{s}}$$

$$v_i = ?$$

AVERAGE \rightarrow

$$v = 60 \frac{\text{m}}{\text{s}}$$

$$v = \frac{v_i + v_f}{2}$$

$$60 = \frac{v_i + 90}{2}$$

$$60(2) = v_i + 90$$

$$120 = v_i + 90$$

$$120 - 90 = v_i$$

$$\boxed{30 \frac{\text{m}}{\text{s}}} = v_i$$

$$d = v t$$

$$300 = v(5)$$

$$\frac{300}{5} = v = 60 \frac{\text{m}}{\text{s}}$$

7) An accelerating object, starting from rest moved 40 m in 10 s. What was the acceleration?

$$v_i = 0 \frac{\text{m}}{\text{s}}$$

$$d = 40 \text{ m}$$

$$t = 10 \text{ s}$$

$$a = ?$$

AVERAGE \rightarrow

$$v = 4 \frac{\text{m}}{\text{s}}$$

$$v = \frac{v_i + v_f}{2}$$

$$4 = \frac{0 + v_f}{2}$$

$$4(2) = v_f = 8 \frac{\text{m}}{\text{s}}$$

$$v_f = v_i + a t$$

$$8 = 0 + a(10)$$

$$\frac{8}{10} = a = \boxed{.8 \frac{\text{m}}{\text{s}^2}}$$

$$d = v t$$

$$40 = v(10)$$

$$\frac{40}{10} = v = 4 \frac{\text{m}}{\text{s}}$$