

Name SOLUTIONS Date _____

Physics Sample Algebra Problems

1) $d = vt$ $v = 7$ $t = 4$ $d = ?$

$$d = (7)(4) = \boxed{28}$$

2) $d = vt$ $v = 7$ $d = 56$ $t = ?$

$$56 = 7t$$

$$\frac{56}{7} = t = \boxed{8}$$

3) $v_f = v_i + at$ $v_i = 0$ $a = 4$ $t = 8$ $v_f = ?$

$$v_f = 0 + (4)(8)$$

$$v_f = \boxed{32}$$

4) $v_f = v_i + at$ $v_i = 10$ $a = 4$ $t = 12$ $v_f = ?$

$$v_f = 10 + (4)(12)$$

$$v_f = \boxed{58}$$

5) $v_f = v_i + at$ $v_i = ?$ $a = 4$ $t = 12$ $v_f = 60$

$$60 = v_i + (4)(12)$$

$$60 = v_i + 48$$

$$60 - 48 = v_i = \boxed{12}$$

$$6) v_f = v_i + at \quad v_i = 10 \quad a = 4 \quad t = ? \quad v_f = 50$$

$$50 = 10 + (4)t$$

$$50 - 10 = 4t$$

$$40 = 4t$$

$$\frac{40}{4} = t = \boxed{10}$$

$$7) d = v_i t + (1/2)at^2 \quad v_i = 0 \quad t = 7 \quad a = 2 \quad d = ?$$

$$d = 0(7) + \frac{1}{2}(2)(7)^2$$

$$d = 0 + 49$$

$$d = \boxed{49}$$

$$8) d = v_i t + (1/2)at^2 \quad v_i = 0 \quad t = 4 \quad a = ? \quad d = 100$$

$$100 = (0)(4) + \frac{1}{2}(a)(4)^2$$

$$100 = 0 + 8a$$

$$\frac{100}{8} = a = \boxed{12.5}$$

$$9) d = v_i t + (1/2)at^2 \quad v_i = 0 \quad t = ? \quad a = 6 \quad d = 270$$

$$270 = (0)t + \frac{1}{2}(6)t^2$$

$$270 = 3t^2$$

$$\frac{270}{3} = t^2$$

$$90 = t^2$$

$$\sqrt{90} = t = \boxed{9.5}$$

$$10) d = v_i t + (1/2)at^2 \quad v_i = 10 \quad t = 10 \quad a = ? \quad d = 150$$

$$150 = (10)(10) + \frac{1}{2}a(10)^2$$

$$150 = 100 + 50a$$

$$150 - 100 = 50a$$

$$50 = 50a$$

$$\frac{50}{50} = a = \boxed{1}$$

11) $m_1 v_{1i} + m_2 v_{2i} = m_1 v_{1f} + m_2 v_{2f}$ $m_1 = 5$ $v_{1i} = 8$ $m_2 = 3$ $v_{2i} = 4$ $v_{1f} = 2$ $v_{2f} = ?$

$$(5)(8) + (3)(4) = (5)(2) + 3v_{2f}$$

$$40 + 12 = 10 + 3v_{2f}$$

$$52 = 10 + 3v_{2f}$$

$$52 - 10 = 3v_{2f}$$

$$42 = 3v_{2f}$$

$$\frac{42}{3} = v_{2f} = \boxed{14}$$

12) $mgh = (1/2)mv^2$ $v = 3$ $m = 5$ $g = 10$ $h = ?$

$$(5)(10)h = \frac{1}{2}(5)(3)^2$$

$$50h = 22.5$$

$$h = \boxed{.45}$$

13) $mgh = (1/2)mv^2$ $v = ?$ $m = 4$ $g = 15$ $h = 80$

$$(4)(15)(80) = \frac{1}{2}(4)v^2$$

$$4800 = 2v^2$$

$$\frac{4800}{2} = v^2$$

$$2400 = v^2$$

$$\sqrt{2400} = v = \boxed{49}$$

14) $v_f = v_i + at$ $d = v_i t + (1/2)at^2$ $v_f = 10$ $a = 2$ $t = 3$ $d = ?$

$$10 = v_i + (2)(3)$$

$$10 = v_i + 6$$

$$10 - 6 = v_i$$

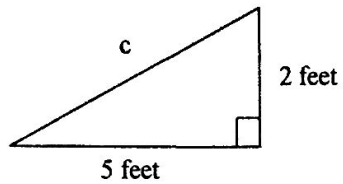
$$4 = v_i$$

$$d = (4)(3) + \frac{1}{2}(2)(3)^2$$

$$d = 12 + (1)(9)$$

$$d = \boxed{21}$$

A little trigonometry



Use this picture for the next three questions.

- 1) In the picture above, what is the length of side c of the triangle?

$$a^2 + b^2 = c^2$$

$$5^2 + 2^2 = c^2$$

$$29 = c^2$$

$$\sqrt{29} = c = \boxed{5.4}$$

- 2) How many degrees is the angle opposite side c ?

$$\boxed{90^\circ}$$

- 3) How many degrees is the angle opposite the side with a length of 2 feet?

$$\tan \theta = \frac{2}{5}$$

$$\theta = \tan^{-1}\left(\frac{2}{5}\right)$$

$$\theta = \boxed{21.8^\circ}$$