

$$a = \frac{v_f - v_0}{t}$$

$$= \frac{28 \text{ m/s} - 0}{8.0 \text{ s}}$$

$$= 3.5 \text{ m/s}^2$$

10.

v_0	v_f	a	d	t
30.0 m/s	0	X	?	7.20 s

$$d = \left(\frac{v_f + v_0}{2} \right) t$$

$$= \left(\frac{0 + 30.0 \text{ m/s}}{2} \right) (7.20 \text{ s})$$

$$= 108 \text{ m}$$

11.

v_0	v_f	a	d	t
20.0 m/s	-20.0 m/s	-9.80 m/s ²	X	?

$$a = \frac{v_f - v_0}{t}$$

$$-9.80 \text{ m/s}^2 = \frac{-20.0 \text{ m/s} - 20.0 \text{ m/s}}{t}$$

$$t = 4.08 \text{ s}$$

12.

v_0	v_f	a	d	t
3.0 m/s	X	-9.80 m/s ²	-75 m	?

Find v_f first

$$v_f^2 = v_0^2 + 2ad$$

$$= (3.0 \text{ m/s})^2 + 2(-9.80 \text{ m/s}^2)(-75 \text{ m})$$

$$v_f = -38.5 \text{ m/s}$$

Now find t

$$a = \frac{v_f - v_0}{t}$$

$$-9.80 \text{ m/s}^2 = \frac{-38.5 \text{ m/s} - 3.0 \text{ m/s}}{t}$$

$$t = 4.2 \text{ s}$$

13. Convert 65 km/h to m/s

$$65 \text{ km/h} \times 1000 \text{ m/km} \times \frac{1}{3600} \text{ h/s} = 18 \text{ m/s}$$

$$v = \frac{d}{t}$$

$$d = vt$$

$$= (18 \text{ m/s})(0.35 \text{ s})$$

$$= 6.3 \text{ m}$$

14.

v_0	v_f	a	d	t
0	?	?	21 m	5.0 s

a) $v_{\text{average}} = \frac{d}{t}$

$$= \frac{21 \text{ m}}{5.0 \text{ s}}$$

$$= 4.2 \text{ m/s east}$$

b) $d = \left(\frac{v_f + v_0}{2} \right) t$

$$21 \text{ m} = \left(\frac{v_f + 0}{2} \right) (5.0 \text{ s})$$

$$v_f = \frac{2(21 \text{ m})}{5.0 \text{ s}}$$

$$= 8.4 \text{ m/s east}$$

c) $a = \frac{v_f - v_0}{t}$

$$= \frac{8.4 \text{ m/s} - 0}{5.0 \text{ s}}$$

$$= 1.7 \text{ m/s}^2 \text{ east}$$

15.

v_0	v_f	a	d	t
5.0 m/s	X	-9.80 m/s ²	?	<input type="checkbox"/>

Find the displacement during the 1st four seconds

$$d = v_0 t + \frac{1}{2} a t^2$$

$$= (-5.0 \text{ m/s})(4.0 \text{ s}) + \frac{1}{2} (-9.80 \text{ m/s}^2)(4.0 \text{ s})^2$$

$$= -98 \text{ m}$$

Find the displacement during the 1st three seconds

$$d = v_0 t + \frac{1}{2} a t^2$$

$$= (-5.0 \text{ m/s})(3.0 \text{ s}) + \frac{1}{2} (-9.80 \text{ m/s}^2)(3.0 \text{ s})^2$$

$$= -59 \text{ m}$$

Stone falls $98 \text{ m} - 59 \text{ m} = 39 \text{ m}$