10.

v_0	v_f	a	d	t
0	12.0 m/s	2.40 m/s^2	X	?

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

$$2.40 \text{ m/s}^2 = \frac{12.0 \text{ m/s} - 0}{t}$$

$$t = \frac{12.0 \text{ m/s} - 0}{2.40 \text{ m/s}^2}$$

$$= 5.00 \text{ s}$$

11.

v_0	v_f	a	d	t
0	?	X	19.0 m	7.10 s

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

$$19.0 \text{ m} = \left(\frac{v_f + 0}{2}\right)7.10 \text{ s}$$

$$v_f = \frac{2(19.0 \text{ m})}{7.10 \text{ s}}$$

$$= 5.35 \text{ m/s north}$$

12.

v_0	v_f	a	d	t
?	X	0.71 m/s^2	8.0 m	3.2 s

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

$$8.0 \text{ m} = v_0(3.2 \text{ s}) + \frac{1}{2}(0.71 \text{ m/s}^2)(3.2 \text{ s})^2$$

$$v_0 = 1.4 \text{ m/s south}$$

13.

v_0	v_f	a	d	t
15.0 m/s	35.0 m/s	?	43.0 m	X

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

$$(35.0 \text{ m/s})^2 = (15.0 \text{ m/s})^2 + 2(a)(43.0 \text{ m})$$

$$a = 11.6 \text{ m/s}^2 \text{ west}$$

14.

v_0	v_f	a	d	t
7.0 m/s	19.0 m/s			

$$v_{\text{average}} = \frac{v_f + v_0}{2}$$

$$= \frac{(7.0 \text{ m/s} + 19.0 \text{ m/s})}{2}$$

$$= 13.0 \text{ m/s west}$$

15.

v_0	v_f	a	d	t
?	25.0 m/s	1.50 m/s^2	X	10.0 s

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

$$1.50 \text{ m/s}^2 = \frac{25.0 \text{ m/s} - v_0}{10.0 \text{ s}}$$

$$v_0 = 25.0 \text{ m/s} - (10.0 \text{ s})(1.50 \text{ m/s}^2)$$

$$= 10.0 \text{ m/s east}$$

16.

v_0	v_f	a	d	t
?	14.0 m/s	X	25.0 m	1.90 s

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

$$25.0 \text{ m} = \left(\frac{14.0 \text{ m/s} + v_0}{2}\right)(1.90 \text{ s})$$

$$v_0 = \frac{2(25.0 \text{ m})}{1.90 \text{ s}} - 14.0 \text{ m/s}$$

$$= 12.3 \text{ m/s north}$$

17.

v_0	v_f	a	d	t
0	?	X	31.0 m	5.6 s

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

$$31.0 \text{ m} = \left(\frac{v_f + 0}{2}\right)5.6 \text{ s}$$

$$v_f = \frac{2(31.0 \text{ m})}{5.6 \text{ s}}$$

$$= 11 \text{ m/s west}$$

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