

6.17

$$v_0 = 16 \text{ m/s}$$

$$t = 2 \text{ s}$$

$$v_f = 4 \text{ m/s}$$

$$a = ?$$

$$v_f = v_0 + at$$

$$4 = 16 + a(2)$$

$$2a = 4 - 16 = -12$$

$$\boxed{a = -6 \text{ m/s}^2}$$

6.18 a) max. displ. occurs when $v_f = 0$

$$x = ?$$

$$v_f = 0$$

$$v_0 = 16 \text{ m}$$

$$a = -6 \frac{\text{m}}{\text{s}^2} \text{ (from 6.17)}$$

$$v_f^2 = v_0^2 + 2ax$$

$$0^2 = 16^2 + 2(-6)x$$

$$0 = 256 - 12x$$

$$12x = 256$$

$$x = \frac{256}{12} = \boxed{21.3 \text{ m}}$$

b)

$$v_f = ?$$

$$v_0 = 16$$

$$t = 4 \text{ s}$$

$$v_f = v_0 + at$$

$$= 16 + (-6)(4)$$

$$= 16 - 24$$

$$= \boxed{-8 \text{ m/s}}$$

(moving downward)