

- a) 314 m
- b) 8.9 s
- c) 16.9 s

$$a = -9.8 \frac{m}{s^2}$$

phase 1

$$v_f^2 = v_i^2 + 2ad$$

$$v_f = \sqrt{v_i^2 + 2ad}$$

$$= \sqrt{45^2 + 2(2)(175)}$$

$$= 52.2 \frac{m}{s}$$

$$v_f = v_i + at$$

$$t = \frac{v_f - v_i}{a} = \frac{52 - 45}{2} = 3.5s$$

phase 2

$$v_i = 52.2 \frac{m}{s}$$

$$v_f = 0$$

$$a = -9.8 \frac{m}{s^2}$$

$$v_f^2 = v_i^2 + 2ad$$

$$d = \frac{-v_i^2}{2a} = \frac{-52^2}{2(-9.8)} = 138m$$

$$v_f = v_i + at$$

$$\frac{-v_i}{a} = t$$

$$5.3s = \frac{-52.2}{-9.8} = t$$

phase 3

$$a = -9.8 \frac{m}{s^2}$$

$$d = -138 - 175 = -313m$$

$$v_i = 0$$

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

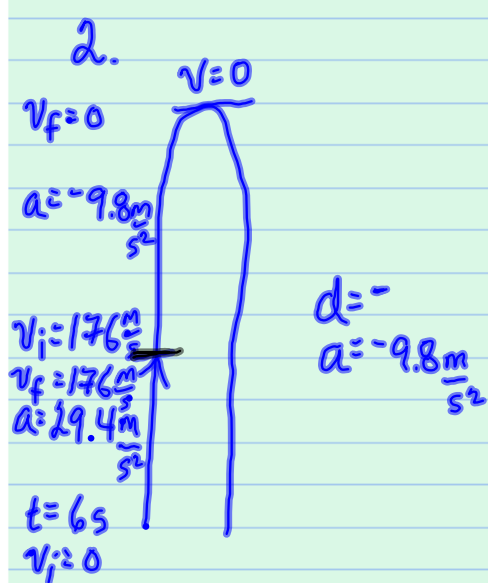
$$\sqrt{\frac{d}{.5a}} = t$$

$$8s = \sqrt{\frac{-313}{.5(-9.8)}} = t$$

$$v_f = v_i + at$$

$$= -9.8(8)$$

$$= 78.4 \frac{m}{s}$$



a)

b)

①  $d = v_i^0 t + \frac{1}{2} a t^2$   
 $= 0.5 (29.4) (6^2) = 529 \text{ m}$  phase 1

②  $v_f = v_i^0 + a t$   
 $= 29.4 (6)$   
 $= 176 \frac{m}{s}$  phase 1

③  $v_f^0 = v_i^0 + 2 a d$

$\frac{-v_i^2}{2a} = d$

$d = \frac{-176^2}{2(-9.8)} = 1580 \text{ m}$  phase 2

$529 + 1580 = \boxed{2109 \text{ m}}$

④  $v_f^2 = v_i^0 + 2 a d$  phase

$v_f = \sqrt{2 a d}$   
 $= \sqrt{2(-9.8)(-2109)}$

$= \boxed{-203 \frac{m}{s}}$