

$$1) \quad \Delta x = 25.2 \text{ m}$$

$$\Delta y = 24 \text{ m}$$

$$v_{e.1.4s} = 20.7 \text{ m/s}$$

$$\theta = 30^\circ \text{ above horizontal}$$

$$2) \quad \Delta x = 30 \text{ m}$$

$$\Delta y = 40.9 \text{ m}$$

$$v_{e1.5s} = 28.2 \text{ m/s}$$

$$\theta = 44.8^\circ \text{ above horizontal}$$

3)

ΔX	v_{ix}	Δt	ΔY	v_{iy}	v_{ry}	a	Δt
	$10 \cos 0$ 10 m/s		-20 m	$10 \sin 0$ 0 m/s		-9.81	

$$\theta = 0^\circ$$

$$v_0 = 10 \text{ m/s}$$

$$\Delta X = v_{ix} \Delta t$$

$$= (10 \text{ m/s})(2 \text{ s})$$

$$\Delta X = 20 \text{ m}$$

$$\Delta Y = v_{iy} \Delta t + \frac{1}{2} a \Delta t^2$$

$$-20 = 0 + \frac{1}{2} (-9.81) \Delta t^2$$

$$-20 = \frac{1}{2} (-9.81) \Delta t^2$$

$$\frac{-20}{-4.9} = \frac{-4.9 \Delta t^2}{-4.9}$$

$$\sqrt{4} = \sqrt{\Delta t^2}$$

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

5)

Δx	v_{ix}	t	Δy	v_{iy}	v_{fy}	a	t
2m			-.7m	0m/s		-9.81	

$$v_0 = v_{ix} \cos \theta$$

$$v_0 = v_{iy} \sin \theta$$

$$\theta = 0$$

$$1 \text{ (2)} \quad \Delta x = v_{ix} \Delta t$$

$$\frac{2}{.38} = \frac{v_{ix} (.38)}{.38}$$

$$v_{ix} = 5.3 \text{ m/s}$$

$$v_0 = 5.3 \text{ m/s}$$

$$1 \quad \Delta y = v_{iy} \Delta t + \frac{1}{2} a \Delta t^2$$

$$-.7 \text{ m} = 0 + \frac{1}{2} (-9.81) \Delta t^2$$

$$\frac{-.7 \text{ m}}{-4.9} = t^2$$

$$0.14 = t^2$$

$$t = 0.38 \text{ s}$$

b)

ΔX	v_{ix}	t	ΔY	v_{iy}	v_{fy}	a	t
	24 m/s			18 m/s	0 m/s	-9.81	

$$v_{fy} = v_{iy} + a \Delta t$$

$$0 = 18 + (-9.81) \Delta t$$

$$\frac{-18}{-9.81} = \frac{-9.81 \Delta t}{-9.81}$$

$$1.8 \text{ s} = \Delta t$$