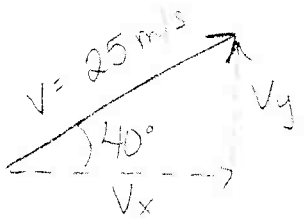
P #B

Ch. 3 Worksheet



Find V_x & V_y:

$V_x = V \cdot \cos\theta$
$= (25\ m/s) \cdot \cos 40°$

$V_x = 19.2\ m/s$

$V_y = V \cdot \sin\theta$
$= (25\ m/s) \cdot \sin 40°$

$V_y = 16.1\ m/s$

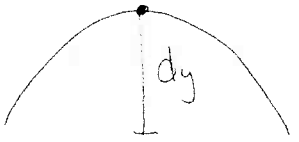
Find time:

$V_{yo} = 16.1\ m/s$
$V_{yf} = 0\ m/s$ (@ top)
$a = -9.8\ m/s^2$

$V_f = V_o + a \cdot t$
$0\ m/s = 16.1\ m/s + (-9.8\ m/s^2) \cdot t$

$t = 1.64\ sec$

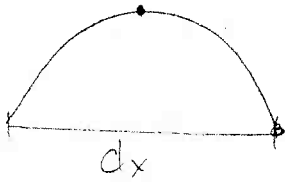
a) $t = 1.64\ sec$



$d_y = \frac{1}{2} \cdot a \cdot t^2$
$= \frac{1}{2} \cdot (9.8\ m/s^2)(1.64\ sec)^2$

$\boxed{d_y = 13.2\ m}$

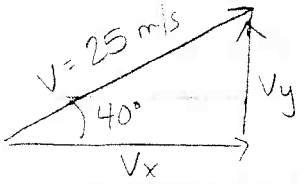
b)



$t_{total} = 2 \cdot (1.64\ sec)$
$= 3.28\ sec$
$V_x = 19.2\ m/s$

$d_x = V_x \cdot t$
$= (19.2\ m/s)(3.28\ sec)$

$\boxed{d_x = 62.8\ m}$



From Question A:
$V_x = 19.2$ m/s
$V_y = 16.1$ m/s

$V_{wind} = -8$ m/s

c) The wind blows in a horizontal direction, so V_y is not affected.

Altitude remains constant

d) Wind blows against the rocket's velocity, so

$$V_x = 19.2 \text{ m/s} - 8 \text{ m/s} = 11.2 \text{ m/s}$$

$t = 3.3$ sec (from Question A)

$$d_x = V_x \cdot t$$
$$= (11.2 \text{ m/s}) \cdot (3.3 \text{ sec})$$

$d_x = 36.96$ m