

# Worksheet - Projectile Motion Problems 2

1.	K	V
$V = 18 \frac{m}{s}$	d	
$\theta = 35^\circ$	t	
	h	

distance

$$d = \frac{V^2 \sin(2\theta)}{g}$$

$$= \frac{18^2 \sin(2 \times 35)}{9.8}$$

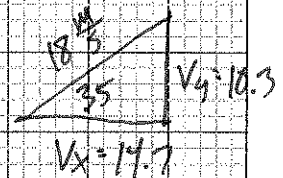
$$d = 31.1 \text{ m}$$

time

$$V_f = V_i + at$$

$$-10.3 = 10.3 - 9.8t$$

$$t = 2.13$$



height

$$V_f^2 = V_i^2 + 2ad$$

$$0 = 10.3^2 - 2(9.8)d$$

$$h = 5.4 \text{ m}$$

2.	K	V
$V = 6.8 \frac{m}{s}$	$\theta$	
$d = 20 \text{ m}$		

$$d = \frac{V^2 \sin(2\theta)}{g}$$

$$2 = \frac{6.8^2 \sin(2\theta)}{9.8}$$

$$\theta = 12.5^\circ$$

$$\theta = 77.5^\circ$$

Other angle  
=  $90 - \theta$

3.	K	V
$\theta = 28^\circ$	V	
$d = 7.8 \text{ m}$		

$$d = \frac{V^2 \sin(2\theta)}{g}$$

$$7.8 = \frac{V^2 \sin 56}{9.8}$$

$$V = 9.6 \frac{m}{s}$$

4.	K	V
$\theta = 34.5^\circ$	h	
$V = 65.2 \frac{m}{s}$	d	
	t	

$$d = \frac{V^2 \sin(2\theta)}{g}$$

$$= \frac{65.2^2 \sin 69}{9.8}$$

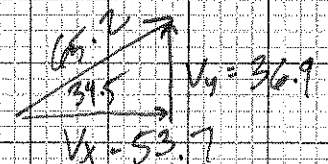
$$d = 405 \text{ m}$$

time

$$V_f = V_i + at$$

$$-36.9 = 36.9 - 9.8t$$

$$t = 7.5 \text{ s}$$



$$h = \frac{1}{2} g t^2$$

$$= 4.9 (3.77)^2$$

$$h = 69.5 \text{ m}$$

S.	K	V
g		h =
h = d		

$$d = \frac{v^2 \sin 2\theta}{g}$$

$$d = h$$

$$\frac{v^2 \sin 2\theta}{g} = \frac{v^2 \sin^2 \theta}{2g}$$

$$2 \sin \theta \cos \theta = \sin^2 \theta$$

$$4 \cos \theta = \sin \theta$$

$$4 = \frac{\sin \theta}{\cos \theta}$$

$$4 = \tan \theta$$

$$\theta = 75.96^\circ$$

$$v_f^2 = v_i^2 + 2ah$$

$$h = \frac{v_i^2}{2g}$$

$$h = \frac{v^2 \sin^2 \theta}{2g}$$

$$v_i = v \sin \theta$$

Check

$d = \frac{v^2 \sin 2\theta}{g}$ $= \frac{100 \sin(75.96^\circ \cdot 2)}{9.8}$ $= 4.8 \text{ m}$	$h = \frac{v_i^2}{2g}$ $= \frac{4.8 \text{ m}}{1}$ $= 4.8 \text{ m}$
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G.	K	V
d = 27m		$\theta$
$v = 35 \frac{\text{m}}{\text{s}}$		

$$d = \frac{v^2 \sin(2\theta)}{g}$$

$$27 = \frac{35^2 \sin(2\theta)}{9.8}$$

$$\theta = 6.24^\circ$$