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ASSIGNMENT
FUNCTIONS & TRIGONOMETRY
201-009-50 C2
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p. 89

#2 e slope $m = \frac{1}{2}$, through point (8,1)

$$y = mx + b$$

$$y = \frac{1}{2}x + b$$

plug in point

$$1 = \frac{1}{2}(8) + b$$

$$1 = 4 + b$$

$$b = -3$$

$$\boxed{y = \frac{1}{2}x - 3} \quad \textcircled{1}$$

5f (0, -5) is a point

& $x + 3y - 6 = 0$ is parallel so has the same slope

$$x + 3y - 6 = 0$$

$$3y = -x + 6$$

$$y = -\frac{1}{3}x + \frac{6}{3} \Rightarrow y = -\frac{1}{3}x + 2$$

$$\text{slope is } m = -\frac{1}{3}$$

$$y = -\frac{1}{3}x + b$$

$$-5 = -\frac{1}{3}(0) + b \Rightarrow b = -5$$

$$\boxed{y = -\frac{1}{3}x - 5} \quad \textcircled{2}$$

6e (3,3) is a point

$x + 4y = 10$ is perpendicular

$$4y = -x + 10$$

$$y = -\frac{1}{4}x + \frac{10}{4}$$

since line is perpendicular

$$m = 4$$

$$y = 4x + b$$

$$3 = 4(3) + b$$

$$b = 3 - 12 = -9$$

$$\boxed{y = 4x - 9} \quad (2)$$

8b

(2,5) & (k,-1) are points

slope is 3

$$m = \frac{\Delta y}{\Delta x} = \frac{-1-5}{k-2} = \frac{-6}{k-2} = \text{slope}$$

so $\frac{-6}{k-2} = 3$

$$-6 = 3(k-2)$$

$$-6 = 3k - 6$$

$$0 = 3k$$

$$\boxed{k = 0} \quad (2)$$

$$\# 1b \quad y = -3x^2$$

$$\text{vertex : } x = \frac{-b}{2a} = \frac{-0}{2(-3)} = 0$$

$$y = -3(0)^2 = 0 \quad (0, 0)$$

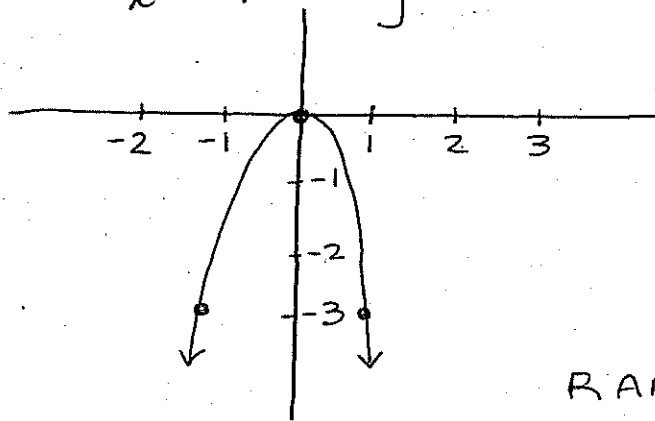
y-intercept $(0, 0)$

x-intercepts $(0, 0)$

Since we only have one point, we need two more to graph the curve

$$x = 1 \quad y = -3(1)^2 = -3 \quad (1, -3)$$

$$x = -1 \quad y = -3(-1)^2 = -3 \quad (-1, -3)$$



④

RANGE : $\mathbb{R} \leq 0$

$$\# 1f \quad y = -2x^2 + 6x$$

$$\text{vertex } x = \frac{-6}{2(-2)} = \frac{6}{4} = \frac{3}{2}$$

$$y = -2\left(\frac{3}{2}\right)^2 + 6\left(\frac{3}{2}\right)$$

$$= -2\left(\frac{9}{4}\right) + \frac{18}{2}$$

$$= -\frac{9}{2} + \frac{18}{2} = \frac{9}{2}$$

vertex $\left(\frac{3}{2}, \frac{9}{2}\right)$

y-intercept: $x=0$

$$y = -2(0)^2 + 6(0) = 0$$

$$(0,0)$$

x-intercepts $y=0$

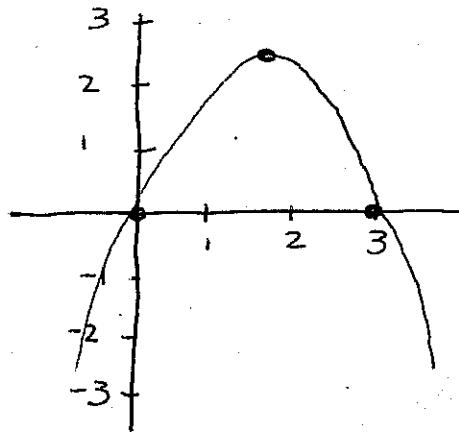
$$0 = -2x^2 + 6x$$

$$= -2x(x-3)$$

$$x=0 \quad x=3$$

$$(0,0), (3,0)$$

RANGE: $\mathbb{R} \leq 9/2$
 $(-\infty, 9/2]$



9 $h(t) = 96t - 16t^2$

(a) $t=5$

$$h(5) = 96(5) - 16(5)^2$$

$$= 80$$

height is 80m

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(b) AT t -value of vertex

$$t = \frac{-96}{2(-16)} = \frac{-96}{-32}$$

$$= 3$$

(d) when $h(t)=0$

$$0 = 96t - 16t^2$$

$$= 16(6 - t)$$

$$t=0 \text{ \& } t=6$$

(c) At $t=3$

$$h(3) = 96(3) - 16(3)^2$$

$$= 144\text{m}$$

MAX height is
144m

AFTER 6 seconds
the projectile
landed