Change this Vertex Form equation of a quadratic:

$$y = -2(x + 5)^2 - 9$$

Into Standard Form

$$y = -2(x + 5)^2 - 9$$

$$-2\left(x^2 + 10x + 25\right) - 9$$

$$-2x^2 - 20x - 50 - 9$$

$$y = -2x^2 - 20x - 59$$

Does this quadratic have a maximum or a minimum?

$$y = -3x^2 + 12x - 7$$

(x,y) 2,5 max

LOS $\dfrac{-12}{-6} = x = 2$

What is the max/min value of this function?

the y-value at the maximum   5

A y-coordinate is WHAT the function equals

When does this max/min occur?

the x-value at the maximum $x = 2$

An x-coordinate is WHEN something happens

Find the VERTEX!

1st → LOS
2nd → y-coord of the vertex

Find the maximum value of this function and when it occurs:

$$y = -5x^2 - 30x + 18$$

LOS: $x = \dfrac{30}{2(-5)} = -3$

Vertex $(-3, 63)$

Max Value: 63

When max occurs: $x = -3$

A company makes syringes. The following equation models their Profit as a function of the number of syringes made per hour.

$P(s) = -0.45s^2 + 360s - 1250$

LOS

$s = \dfrac{-360}{2(-.45)} = 400$

1. Find the number of syringes that should be made per hour in order to maximize the company's Profit.

400

2. What is the maximum Profit?

$P(400) = \$70,750$

The company will have a maximum profit of $70,750 if they make 400 syringes per hour.

You can now do Hwk #17

Pages 248-249   USE GRAPH PAPER

Problems 4, 11, 19, 28, 30, 37-39, 45, 49

A company needs to minimize their costs. The equation below gives their weekly costs (C) as a function of the number of hours each employee works (h).

$C(h) = 0.65h^2 - 45.5h + 876$

Find the minimum costs the company can incur and how many hours each employee should work to reach this minimum.

LOS: $h = \dfrac{45.5}{2(.65)} = 35 \text{ hrs}$

$C(35) = 79.75$

The company will have a minimum cost of 79.75 if employees work 35 hours.

A ball is shot into the air with an initial velocity of 80 ft/sec from the top of a 50 ft tall building. The following equation models the height (ft) of the object as a function of time (sec).

$h(t) = -16t^2 + 80t + 50$

LOS $t = \dfrac{-80}{-32} = 2.5$

1. Find the time it takes the object to reach its maximum height.

2.5 sec

2. Find the maximim height of the object.

$h(2.5) = 150 \text{ ft}$

Forms for the Equation of a Quadratic

Standard Form	Vertex Form	Intercept Form (Factored Form)
$y = ax^2 + bx + c$	$y = a(x - h)^2 + k$	$y = (\quad)(\quad)$

Standard Form

LOS: $x = \dfrac{-b}{2a}$

Vertex: $\left(\dfrac{-b}{2a},\ \right)$

y - int: Replace x with zero **C**

Vertex Form

Vertex: **(h,k)**

LOS: $x = h$

y - int: Replace x with zero *it is NOT k*

Expand each

1. $(x - 5)(x + 7)$

	x	− 5
x	x^2	$-5x$
+7	$+7x$	35

$x^2 + 2x - 35$

$-5 + 7$

2. $(4w + 3)(2w - 9)$

$4w + 3$

	4w	+3
2w	$8w^2$	$+6w$
−9	$-36w$	-27

$8w^2 - 30w - 27$