4.1

$x = \frac{-b}{2a}$

1. $y = x^2 - 8x + 15$

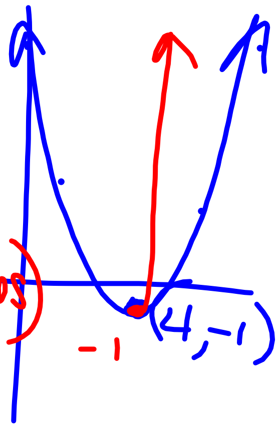
$x = \frac{8}{2(1)} = 4$

$y = 4^2 - 8(4) + 15$

$y = -1$

$v(4, -1)$

x	y
0	15
2	3
4	-1
6	3
8	15



D: all real #s (x-values)

R: $y \geq -1$

4) min $(x, -9)$

up

D: all R R: $y \geq -9$

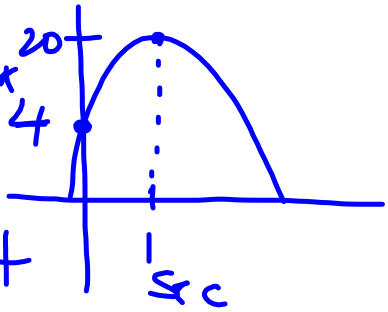
$h(t) = -16t^2 + V_0 t + S_0$

$h(t)$: height of the object at t (time)

t: time

V_0: initial velocity (32) ft

S_0: initial height (4 ft)



$h(t) = -16t^2 + 32t + 4$

$x = \frac{-b}{2a}$

$x = \frac{-32}{-16(2)} = 1$

$h(t) = -16(1)^2 + 32(1) + 4$

$h(t) = 20$ ft

70 people

\$20

\$1400 Income

$x =$ # of price ↑

$I = (\#\text{people})(\$\text{fee})$

$I = (70)(20)$

$I = (70 - 1x)(20 + 1x)$ find max income

$I = 1400 + 70x - 20x - x^2$

$I = -x^2 + 50x + 1400$

a) $x = \frac{-50}{2(-1)} = 25 \Longrightarrow$ New price \$45

$I = -(25)^2 + 50(25) + 1400$

b) $I = \$2025$

max. income

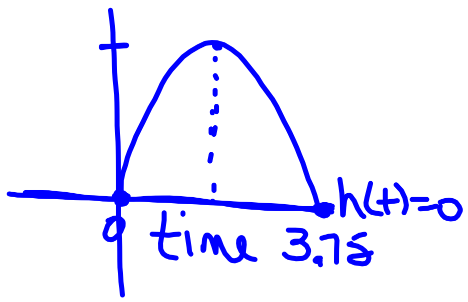
4-2

Solving a quadratic means finding the x-intercepts

8. $h(t) = -16t^2 + V_0 t$

plug in 0 for height (ground level)

$h(t) = -16t^2 + 60t$



$0 = -16t^2 + 60t$

$0 = 4t(-4t + 15)$

$4t = 0 \qquad -4t + 15 = 0$

$t = 0 \qquad 15 = 4t$

$\frac{15}{4} = t$

3.75 sec

4.3)

30. $\boxed{A = lw}$ $w = 7$

$l = 2 + w$

$l = 9$

$A = l w$

$63 = (2 + w)(w)$

$63 = 2w + w^2$

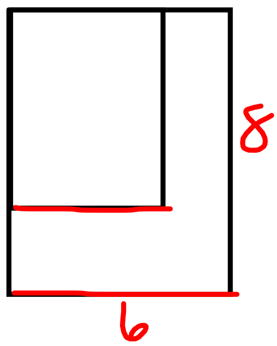
$w^2 + 2w - 63 = 0$

$(w + 9)(w - 7) = 0$

$w = \cancel{-9}, 7$

4.3

#21



$A_{ORIG} = (6)(8) = 48$

$A_{NEW} = 24 = (6-x)(8-x)$

$24 = 48 - 14x + x^2$

$x^2 - 14x + 24 = 0$

$(x - 12)(x - 2) = 0$

$x = \cancel{12}, 2$