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Ann: Extra Credit - Feb 22, 2018
Hands on learning (7-256)

Library of functions → Tues 2/27 - 10:00 - 11.15 am
→ Fri 3/2 - 1:00 - 2:15 pm

Piecewise-Defined Functions → Tues 3/27 - 10:00 - 11:15 am
→ Fri 3/30 - 1:00 - 2.15 pm

Transformations Techniques → Tues 4/10 - 10:00 → 11:15 am
Fri 4/13 - 1:00 - 2.15 pm

Finish: § 4.1. Linear Functions and Their Properties (pp 58-59)
All of start § 4.3. Quadratic Functions and Their Properties (pp. 60-62)
§ 4.4. Building Quadratic Models From Verbal Descriptions (pp. 63-77)

(*) 14 Days until the Chapter 9 & 5 Test.

P 58 # 26 $S(p) = -300 + 50p$ $D(p) = 960 - 55p$

(a) equilibrium

Demand = Supply
$D(p) = S(p)$
$960 - 55p = -300 + 50p$
$960 + 300 = 55p + 50p$

$\frac{1260}{105} = \frac{105p}{105}$
$12 = p$
Equilibrium price = \$12.00

Find equilibrium quantity (we can use either one)

$S(p) = -300 + 50p$
$S(12) = -300 + 50(12)$
$= -300 + 600$
$= 300$ t-shirts

$D(p) = 960 - 55p$
$D(12) = 960 - 55(12)$
$= 960 - 660$
$= 300$ t-shirts

02.22.2018 1:00p TR Coll. Alg. Sections 4.1 (End) and 4.3 (All) 2/22/18, 8:40 AM, 1h 16m 42s

livescribe

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(b) demanded < supplied

$d(p) < s(p)$

$960 - 55p < -300 + 50p$

$960 + 300 < 55p + 50p$

$\frac{1260}{105} < \frac{105p}{105}$

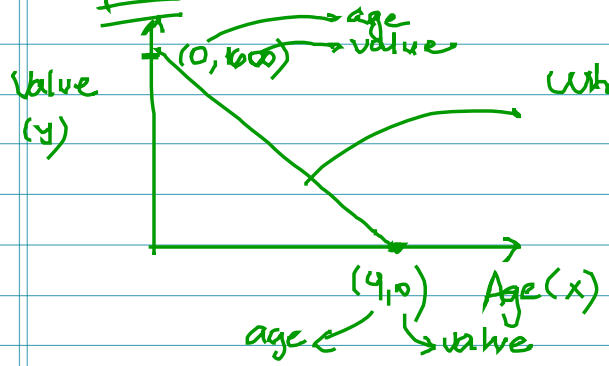
$12 < p$

$p > 12$

obs: Gs soon as the price goes up, the demand goes down.

(c) Answer: the price will go down until it reaches equilibrium

p 59 #29



(a)

What's the equation of this line? → We need:
- a point
- slope

We can choose a point

Ex: (0, 1600)

x_1, y_1

We have 2 points.

(0, 1600)

(4, 0) → y intercept.

$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 1600}{4 - 0} = -\frac{1600}{4}$

$\text{slope} = -400$

It's easier to use the y intercept point →

$y = mx + b$

$y = -400x + 1600$

$V(x) = -400x + 1600$

final answer

(b) zero is the smallest age and value a computer can have.

So, the Domain shall begin in the smallest age until the smallest value

Domain $[0,4]$

#30

(a) $C(x) = mx + b$

$C(x) = 100x + 2000$

m = variable costs → 100

b = fixed costs → 2000

↳ final answer

4.3 p. 60

Quadratic functions → exponent 2

↳ graphic is a parabola ∪

#21

$f(x) = x^2 + 22x$

a) What are the intercepts?

y int $(x=0)$ $y = f(x)$

$f(x) = x^2 + 22x$

$f(x) = 0^2 + 22 \cdot 0$

$y = 0 + 0$

$y = 0$

$(0,0)$

x int $(y=0)$

$0 = x^2 + 22x$

$0 = x(x+22)$

$x = 0$ $\quad$ $x + 22 = 0$

$(0,0)$ $\quad$ $x = -22$

~~$(0, -22)$~~

$(-22, 0)$

b) What is the vertex?

$ax^2 + bx + c$

$f(x) = 1x^2 + 22x + 0$

$f(x) = x^2 + 22x$

$a = 1 \quad b = 22 \quad c = 0$

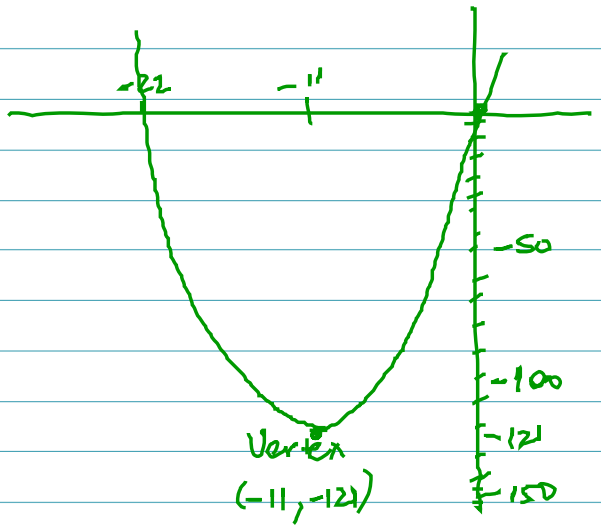
$(ax^2 + bx + c)$

$\left(\frac{-22}{2(1)}, 0 - \frac{22^2}{4(1)}\right)$

$\left(\frac{-b}{2a}, c - \frac{b^2}{4a}\right)$ ← formula for vertex (x and y)

$(-11, -121)$ → this is the vertex

(b) the graph opens up, because (a) is positive.



(c) Domain : $(-\infty, \infty)$

Range : $[-121, \infty)$

(d) Increasing : $(-11, \infty)$

Decreasing : $(-\infty, -11)$

#41

$f(x) = x^2 + 6x - 7$

$f(x) = -7$ for

$= y$ → so, $y = -7$

$f(x) = x^2 + 6x - 7$

$y = x^2 + 6x - 7$

$-7 = x^2 + 6x - 7$

$+7 \qquad +7$

$0 = x^2 + 6x$

$0 = x(x+6)$

$x = 0 \qquad x + 6 = 0$

$x = -6$

Answer: $\{0, -6\}$

#43

In this section, if we are asked for a min or max for a parabola (quadratic function), we have to find the vertex

$R(p) = -4p^2 + 24000p$

$y = (-4)x^2 + (24000)p + c$

$ax^2 + bx + c$

$a = -4 \quad b = 24000 \quad c = 0$

$\left(\frac{-b}{2a}, c - \frac{b^2}{4a}\right)$ → vertex

$\left(\frac{-24000}{2 \cdot (-4)}, 0 - \frac{24000^2}{4 \cdot (-4)}\right)$

$\left(\frac{-24000}{-8}, 36000000\right)$

$(3000, 36000000)$

$x \quad y$

$p \quad R$

price Revenue

p. 62 #31

Vertex $(2, -4)$
$h \quad k$

thru point $(1, -1)$
$x \quad y$

So, $h=2 \quad k=-4 \quad x=1 \quad y=-1$

$y = a(x-h)^2 + k$ → vertex form (not formula)

$-1 = a(1-2)^2 + (-4)$

$-1 = a - 4$

$+4 \qquad +4$

$3 = a$

$a = 3$

So, $a=3 \quad h=2 \quad k=-4$

$y = a(x-h)^2 + k$

$y = 3(x-2)^2 + (-4)$

$\boxed{y = 3(x-2)^2 - 4}$ → vertex form

Step 4: Standard form for a parabola is $\boxed{ax^2 + bx + c}$

$y = 3(x-2)^2 - 4$

$y = 3(x-2)(x-2) - 4$

$y = 3[x^2 - 2x - 2x + 4] - 4$

$y = 3[x^2 - 4x + 4] - 4$

$y = 3x^2 - 12x + 12 - 4$

$\boxed{y = 3x^2 - 12x + 8}$ answer in standard form for a parabola

#30 $h=-3$ $k=-4$ $x=0$ $y=13$

Vertex $(-3,-4)$ (h, k)

point $(0,-13)$ (x, y)

$y=a(x-h)^2+k$

$-13=a(0+3)^2-4$

$13=a(3)^2-4$

$13=9a-4$

$9a=+4+13$

$9a=+17$

$a=\frac{17}{9}$

$13=a(0+3)^2-4$

$13=a(0+3)(0+3)-4$

$-13=a(0+3)^2-4$

$-13=a(3)^2-4$

$-13=9a-4$

$+4 \quad +4$

$\frac{-9}{9}=\frac{9a}{9}$

$a=-1$

So, $y=a(x-h)^2+k$

$\boxed{y=-1(x+3)^2-4}$ vertex form

ax^2+bx+c

$y=-1(x+3)^2-4$

$y=-1(x+3)(x+3)-4$

$y=-1[x^2+3x+3x+9]-4$

$y=-1[x^2+6x+9]-4$

$y=-x^2-6x-9-4$

$\boxed{y=-x^2-6x-13}$ standard form