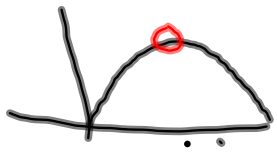
Q2 Pretest

(Unit 1 Q)



D in P x	Price per customer	# of C	Monthly revenue y
0	50	400	$50 \times 400 = 20\,000$
1	$50-1$	$400+10(1)$	$(50-1)\times(400+10)$
2	$50-2$	$400+10(2)$	$(50-2)(400+10(2))$
3	$50-3$	$400+10(3)$	$(50-2)(400+10(3))$
x	$50-x$	$400+10x$	$(50-x)(400+10x)$

$$y = (50-x)(400+10x)$$

$$y = 20\,000 + 500x - 400x - 10x^2$$

$$y = -10x^2 + 100x + 20\,000$$

Q12

$\frac{90}{60} = \frac{1.5}{60} = 0.025$ hrs

① Identify the 2 unknowns.

x = average speed km/h

y = average time (h)

② Make two equations using unknowns

original/usual altered/new

distance km

- make sure units are the same
- look to units

$x \cdot y = 20$ $(x-40)(y+0.025) = 20$

③ Make one (second degree) equation in one unknown using Comparison method

$\frac{x \cdot y}{y} = \frac{20}{y}$

$x = \frac{20}{y}$

① isolate one variable

$\frac{(x-40)(y+0.025)}{(y+0.025)} = \frac{20}{(y+0.025)}$

② put equations equal to each other.

$(x-40) = \frac{20}{y+0.025}$ +40

$x = \frac{20}{(y+0.025)} + 40$

$\frac{20}{y} = \frac{20}{(y+0.025)} + \frac{40(y+0.025)}{1(y+0.025)}$

Lowest Common Denominator

$\frac{20}{y} = \frac{20 + 40(y+0.025)}{(y+0.025)}$

$\frac{20}{y} = \frac{20 + 40y + 1}{(y+0.025)}$

$\frac{20}{y} = \frac{21 + 40y}{(y+0.025)}$

$20(y+0.025) = y(21+40y)$

cross multiplying

$20y + 05 = 21y + 40y^2$

$0 = 40y^2 + 21y - 20y - 0.5$

$0 = 40y^2 + 1y - 0.5$

$a = 40$

$b = 1$

$c = -0.5$

$\Delta = b^2 - 4ac$

$\Delta = (1)^2 - 4(40)(-0.5)$

$\Delta = 81$

$y = \frac{-b \pm \sqrt{\Delta}}{2a}$

$y_1 = \frac{-1+\sqrt{81}}{2(40)}$ $y_2 = \frac{-1-\sqrt{81}}{2(40)}$

$y_1 = 0.1$

$y_2 = -0.125$

④ Find last unknown by subbing $y = 0.1$ into an equation

$x \cdot y = 20$

$x \cdot 0.1\text{(hr)} = 20\text{ km}$

$\frac{0.1\text{(hr)}}{0.1\text{(hr)}}$

$x = 200$ km/hr

(9) (1) Unknowns

x = regular price per bicycle ~~$~~

y = total # of bicycles

$150

(2) Write two equation

original

$x \cdot y = 17500$

altered (sale!!)

$(x - 150)(y + 15) = 17500$