Mathematics 122

Quiz 1   Name: _____Key_____

You must show your work to get full credit.

	①	②	③
p	0	5	10	15
q	50.0	52.5	55.0	57.5

1. The quantities p and q are related by

(a) Write a sentence or two explaining why this is a linear relation showing any calculations you used.

At ① $\frac{\Delta p}{\Delta q} = \frac{5-0}{52.5-50} = \frac{5}{2.5} = 2$

At ② $\frac{\Delta p}{\Delta q} = \frac{10-5}{55-52.5} = \frac{5}{2.5} = 2$

At ③ $\frac{\Delta p}{\Delta q} = \frac{15-10}{57.5-55} = \frac{5}{2.5} = 2$

The rates of change are constant, so it is linear.

(b) Write q as a function of p. $q = \dfrac{p+100}{2}$

$\frac{\Delta p}{\Delta q} = \frac{p-0}{q-50} = 2$

So $p = 2(q-50)$

$= 2q - 100$

$p + 100 = 2q$

$q = \dfrac{p+100}{2}$

(c) If $p = 7$, that is the value of q? $q = 53.5$

use part (b)

$q = \dfrac{7+100}{2} = \dfrac{107}{2} = 53.5$