Mathematics 122

Quiz #1 Name: Key

You must show your work to get full credit.

The variable p and q are related by by the following table

p	20	24	28	32
q	30	25	20	15

1. Explain why this function is linear. (This will involve writing at least one sentence.)

The slopes are $\frac{\Delta q}{\Delta p} = \frac{25-30}{24-20} = \frac{20-25}{28-24} = \frac{15-20}{32-28} = -\frac{5}{4}$.
are constant. Constant slope implies linear.

2. Write q as a function of p.

$q = -\frac{5}{4}p + 55$

$$\frac{\Delta q}{\Delta p} = \frac{q-30}{p-20} = -\frac{5}{4}$$

$$q - 30 = -\frac{5}{4}(p-20) = -\frac{5}{4}p + 25$$

$$q = -\frac{5}{4}p + 25 + 30$$

3. If $q = 27$, what is the cooresponding value of p?

Let $q = 27$ in the last problem and solve for p

$p =$ 22.4

$$27 = -\frac{5}{4}p + 55$$

$$\frac{5}{4}p = 55 - 27 = 28$$

$$p = \frac{4}{5}(28) = 22.4$$