

(1) Find the equation of the line through the points (4, 3), (6, -1).

1 pt

The slope is

$$m = \frac{3 - (-1)}{4 - 6} = \frac{4}{-2} = -2$$

Equation is:  $y - 3 = -2(x - 4)$

or  $y = -2x + 11$

equ is

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

or  $y - (-1) = -2(x - 6)$

solve for  $y = -2(x - 4) + 3 = -2x + 11$

check

$y(4) = -2(4) + 11 = 3$

$y(6) = -2(6) + 11 = -1$

(2) (a) Is the relation between  $p$  and  $q$  in the following table linear? Explain why. (This will involve both some calculations and at least one English sentence explaining why the calculations are relevant.)

$p$	1.0	1.2	1.4	1.6
$q$	3.0	3.4	3.8	4.2

① ② ③

1 pt Is in linear: yes

1 pt Why:

slope at ① =  $\frac{\Delta p}{\Delta q} = \frac{1.2 - 1.0}{3.4 - 3.0} = \frac{0.2}{0.4} = \frac{1}{2}$

slope at ② =  $\frac{\Delta p}{\Delta q} = \frac{1.4 - 1.2}{3.8 - 3.4} = \frac{0.2}{0.4} = \frac{1}{2}$

slope at ③ =  $\frac{\Delta p}{\Delta q} = \frac{1.6 - 1.4}{4.2 - 3.8} = \frac{0.2}{0.4} = \frac{1}{2}$

The slopes are constant so it is linear.

2 pts (b) Find  $q$  as a function of  $p$ .

$\frac{\Delta p}{\Delta q} = \frac{p - 1.0}{q - 3.0} = \frac{1}{2}$

solve for  $q$ :

$2(q - 3) = 2(p - 1)$

$q = 3 + 2(p - 1) = 2p + 1$

or  $q = 2p + 1$   
or  $q = 3 + 2(p - 1)$