

Between

1. The first way to do this is by finding the equation of the line and inputting the x-value of 4:

$$\frac{y-3}{x-2} = \frac{8-3}{8-2}$$

$$\frac{y-3}{x-2} = \frac{5}{6}$$

$$6y-18 = 5x-10$$

$$6y = 5x+8$$

$$y = \frac{5}{6}x + \frac{4}{3}$$

$$\therefore \text{When } x=4, y=4.66$$

$$\therefore a = 4.66$$

The second way, which is equivalent to the first, is by using the fact that slope of a straight line is a constant:

$$\frac{8-a}{8-4} = \frac{8-3}{8-2}$$

$$\therefore \frac{8-a}{4} = \frac{5}{6}$$

$$\therefore 8-a = 10 \frac{10}{3}$$

$$\therefore a = 8 - 3.33$$

$$\therefore a = 4.66$$

The third way to do this would be to use similar triangles, which is the same as the second way.

2. Finding the equation:

$$\frac{y-8}{x-5} = \frac{13-8}{16-5}$$

$$\frac{y-8}{x-5} = \frac{5}{11}$$

$$\therefore 11y-88 = 5x-25$$

$$\therefore 11y = 5x+63$$

$$\therefore 11y - 63 = 5x$$

$$\therefore x = \frac{11y - 63}{5}$$

$$\therefore \text{When } y = 10, x = 9.4 \Rightarrow b = 9.4.$$

Using the slope:

$$\frac{10 - 8}{b - 5} = \frac{13 - 8}{16 - 5}$$

$$\therefore \frac{2}{b - 5} = \frac{5}{11}$$

$$\therefore \frac{22}{5} = b - 5$$

$$\therefore b = 9.4.$$

3a) For all of the following problems, I will only use the second method.

$$\therefore \frac{63 - 37}{8.9 - 4.1} = \frac{c - 37}{7.3 - 4.1}$$

$$\therefore \frac{26}{4.8} = \frac{c - 37}{3.2}$$

$$\therefore c - 37 = \frac{26 \cdot 3.2}{4.8}$$

$$\therefore c = 54.33$$

$$b) \frac{47.5 - 42}{d - 15.05} = \frac{56 - 42}{17.55 - 15.05}$$

$$\frac{5.5}{d - 15.05} = \frac{14}{2.5}$$

$$\therefore \frac{5.5}{d - 15.05} = \frac{14}{2.5}$$

$$\therefore \frac{5.5 \times 2.5}{14} = d - 15.05$$

$$\therefore d = 16.03$$

$$c) \frac{e - 20}{12 - 8} = \frac{20 - 1}{8 - 17}$$

$$\frac{e - 20}{4} = \frac{19}{-9}$$

$$\therefore \frac{e - 20}{4} = \frac{19}{-9}$$

$$\therefore e - 20 = \frac{19 \times 4}{-9} = -7.6$$



$$\frac{-76}{9}$$

$$\therefore e = \cancel{8.22} + 20$$

$$\therefore e = \cancel{28.22} \quad 11.5$$