Nhaira Rul

Age 13

Between

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

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

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

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

$\therefore 6y = 5x+8$

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

$\therefore$ when $x=4$, $y = 4.66\dot{}$

$\therefore a = 4.66\dot{}$

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

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

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

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

$\therefore a = 8 - 3.33\dot{}$

$\therefore a = 4.66\dot{}$

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

2. Finding the equation:

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

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

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

$\therefore 11y = 5x+63$

$\therefore 11y - 63 = 5x$

$\therefore x = \frac{11}{5} - 12\frac{3}{5}$

$\therefore$ 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.

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

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

$\therefore c - 37 = \frac{52}{3}$

$\therefore c = 54.33\dot{}$

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

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

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

$\therefore d = 16.03$.

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

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

$\therefore e - 20 = -\frac{74}{9}$

$\therefore e = 8.22\dot{2} + 20$

$\therefore e = 28.22\dot{2}$