(b) : Since, $PR \perp QT$

$$\therefore \frac{b-4}{a-5} \times \frac{-6/5}{4} = -1 \Rightarrow \frac{b-4}{a-5} \times \frac{3}{10} = 1$$

$$\Rightarrow 10a - 3b = 38$$

Also, $PS \perp QR$,

$$\therefore \frac{-6/5}{-3} \times \frac{b-4}{a+2} = -1$$

$$\Rightarrow \quad 5a + 2b = -2 \qquad \text{...(ii)}$$

Solving equations (i) and (ii), we get

$a = 2, b = -6$

Now, centroid of $\Delta PQR = (c, d)$

$$\Rightarrow \left(\frac{5-2+2}{3}, \frac{4+4-6}{3}\right) = (c, d)$$

$$\Rightarrow \quad c = \frac{5}{3}, \; d = \frac{2}{3}$$

$$\therefore \quad c + 2d = \frac{5}{3} + \frac{4}{3} = 3$$