(18) $\underset{P(-1,3)}{\ } \overset{3}{\text{———}} \; R(x,y) \; \overset{2}{\text{———}} \underset{Q(2,5)}{\ }$

$PR = \frac{3}{5} PQ$

$\Rightarrow \frac{PR}{PQ} = \frac{3}{5}$

let $PR = 3a$, $PQ = 5a$

$RQ = PQ - PR$
$= 5a - 3a$
$= 2a$

$\frac{PR}{RQ} = \frac{3a}{2a}$

$\Rightarrow PR : RQ = 3 : 2$

$x = \frac{2(-1) + 3\times 2}{3+2} = \frac{4}{5}$ | $y = \frac{2(3) + 3\times 5}{3+2} = \frac{21}{5}$

$\therefore R\left(\frac{4}{5}, \frac{21}{5}\right)$

(19) Points $A(k+1, 2k)$, $B(3k, 2k+3)$, $C(5k-1, 5k)$ are collinear

$\therefore ar(\triangle ABC) = 0$

$$\frac{1}{2}\begin{vmatrix} k+1 & 2k \\ 3k & 2k+3 \\ 5k-1 & 5k \\ k+1 & 2k \end{vmatrix} = 0$$

$\Rightarrow [(k+1)(2k+3) - 6k^2 + 15k^2 - (5k-1)(2k+3) + 10k^2 - 2k - 5k^2 - 5k] = 0$

$\Rightarrow 2k^2 + 3k + 2k + 3 + 9k^2 - 10k^2 - 13k + 3 + 5k^2 - 7k = 0$

$\Rightarrow 6k^2 + 6 - 15k = 0$

$(\div 3)$

$2k^2 + 2 - 5k = 0$

$\Rightarrow 2k^2 - 5k + 2 = 0$

$\Rightarrow 2k^2 - k - 4k + 2 = 0$

$\Rightarrow k(2k-1) - 2(2k-1) = 0$

$\Rightarrow (2k-1)(k-2) = 0$

$\Rightarrow 2k-1 = 0,\ k-2 = 0$

$\Rightarrow k = \frac{1}{2},\ k = 2$