

Assignment-2 1-1.5-28

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P(5, -3) and **Q**(3, y) are the points of trisection of the line segment joining **A**(7, -2) and **B**(1, -5). Then y equals

Solution: Given **P**(5, -3), **A**(7, -2), **B**(1, -5) and **Q**(3, y)

Also given that **P** and **Q** are the points of trisection of AB .

Let **Q** divides the line segment AB in the ratio $k : 1$. That implies **P** divides line segment AB in the ratio $1 : k$.

$$\mathbf{P} = \frac{k\mathbf{A} + \mathbf{B}}{k + 1}$$

On solve x coordinate we get $k=2$ Therefore **Q** divides AB in the ratio $2 : 1$

$$\begin{pmatrix} 3 \\ y \end{pmatrix} = \frac{\mathbf{B} + \frac{1}{2}\mathbf{A}}{1 + \frac{1}{2} + 1}$$

$$y = -4.$$

| Point | Description |
|---------|---|
| P(5,-3) | This point divides A(7,-2) and B(1,-5) in the ratio 1:2 |
| Q(3,-4) | This point divides A(7,-2) and B(1,-5) in the ratio 2:1 |

