

2.2.26

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Question:

Find the area of the triangle formed by the points $P(-1.5, 3)$, $Q(6, -2)$ and $R(-3, 4)$.

Solution:

Let us solve the given equation theoretically and then verify the solution computationally

According to the question,

Given three points

$$\mathbf{P} = \begin{pmatrix} -1.5 \\ 3 \end{pmatrix} \quad \mathbf{Q} = \begin{pmatrix} 6 \\ -2 \end{pmatrix} \quad \mathbf{R} = \begin{pmatrix} -3 \\ 4 \end{pmatrix} \quad (0.1)$$

$$\mathbf{Q} - \mathbf{P} = \begin{pmatrix} 7.5 \\ -5 \end{pmatrix} \quad (0.2)$$

$$\mathbf{R} - \mathbf{P} = \begin{pmatrix} -1.5 \\ 1 \end{pmatrix} \quad (0.3)$$

$$ar(PQR) = \frac{1}{2} \|(\mathbf{Q} - \mathbf{P}) \times (\mathbf{R} - \mathbf{P})\| \quad (0.4)$$

$$ar(PQR) = \frac{1}{2} \|(\mathbf{Q} - \mathbf{P}) \times (\mathbf{R} - \mathbf{P})\| = 0 \quad (0.5)$$

points are collinear

From the figure it is clearly verified that the theoretical solution matches with the computational solution.

Area of Triangle PQR = 0.00

