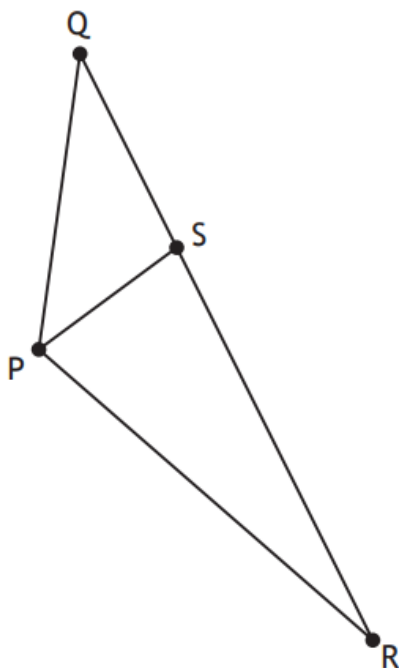


Higher Maths  
SQA 2017 Paper 2  
Question 5



In the diagram,  $\vec{PR} = 9\mathbf{i} + 5\mathbf{j} + 2\mathbf{k}$  and  $\vec{RQ} = -12\mathbf{i} - 9\mathbf{j} + 3\mathbf{k}$ .



(a) Express  $\vec{PQ}$  in terms of  $\mathbf{i}$ ,  $\mathbf{j}$  and  $\mathbf{k}$ . 2

The point S divides QR in the ratio 1:2.

(b) Show that  $\vec{PS} = \mathbf{i} - \mathbf{j} + 4\mathbf{k}$ . 2

(c) Hence, find the size of angle QPS. 5

Answers:

(a)  $-3\mathbf{i} - 4\mathbf{j} + 5\mathbf{k}$

(b) Proof. See marking instructions.

(c)  $45.6^\circ$  or  $0.795$  radians