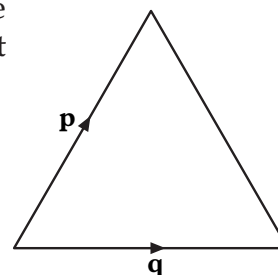


## Geometry Non Calculator AB Grade

- [SQA] 1. Circle P has equation  $x^2 + y^2 - 8x - 10y + 9 = 0$ . Circle Q has centre  $(-2, -1)$  and radius  $2\sqrt{2}$ .
- (a) (i) Show that the radius of circle P is  $4\sqrt{2}$ .  
 (ii) Hence show that circles P and Q touch. 4
- (b) Find the equation of the tangent to the circle Q at the point  $(-4, 1)$ . 3
- (c) The tangent in (b) intersects circle P in two points. Find the  $x$ -coordinates of the points of intersection, expressing your answers in the form  $a \pm b\sqrt{3}$ . 3
- [SQA] 2. For what range of values of  $k$  does the equation  $x^2 + y^2 + 4kx - 2ky - k - 2 = 0$  represent a circle? 5

3. An equilateral triangle of side 3 units is shown. The vectors  $\mathbf{p}$  and  $\mathbf{q}$  are as represented in the diagram. What is the value of  $\mathbf{p} \cdot \mathbf{q}$ ?



- A. 9  
 B.  $\frac{9}{2}$   
 C.  $\frac{9}{\sqrt{2}}$   
 D. 0 2

[END OF QUESTIONS]