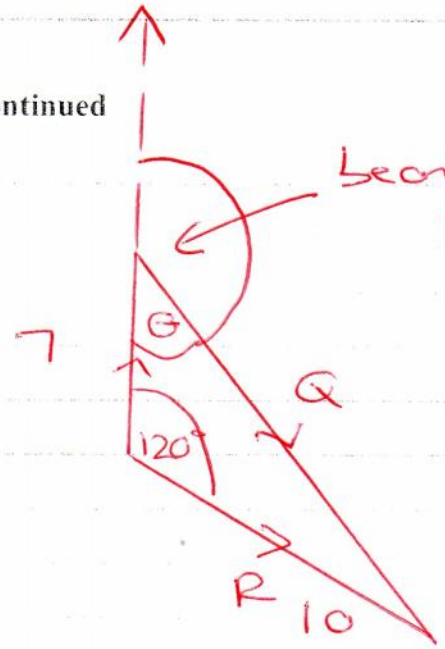
YORKSHIRE MATHS TUTOR

4(i)



Using COSINE RULE

$Q^2 = 10^2 + 7^2 - 2 \times 7 \times 10 \times \cos 120°$

$Q^2 = 149 - (-70)$

$Q^2 = 219$

$Q = \sqrt{219}$

$Q = 14.798649$

$Q = 14.8\text{N}$ (3 sf)

(ii) Find angle θ first using sine rule

$$\frac{\sin\theta}{10} = \frac{\sin 120°}{14.798649}$$

$$\theta = \sin^{-1}\left(\frac{10 \times \sin 120°}{14.798649}\right)$$

$\theta = 35.817526°$

Bearing of Q $= 180 - \theta$

$= 144.18247°$

Bearing $= 144°$ (3 sf)

Q4

(Total 9 marks)

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5.

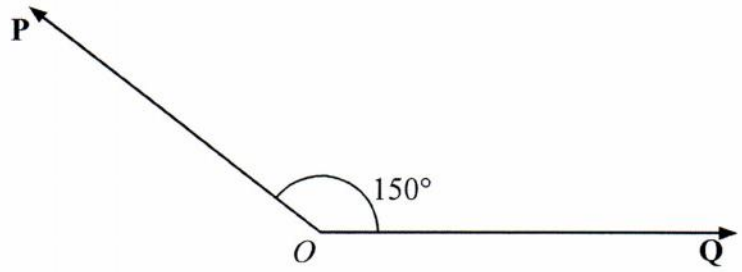


Figure 1

Two forces **P** and **Q** act on a particle at a point O. The force **P** has magnitude 15 N and the force **Q** has magnitude X newtons. The angle between **P** and **Q** is 150°, as shown in Figure 1. The resultant of **P** and **Q** is **R**.

Given that the angle between **R** and **Q** is 50°, find

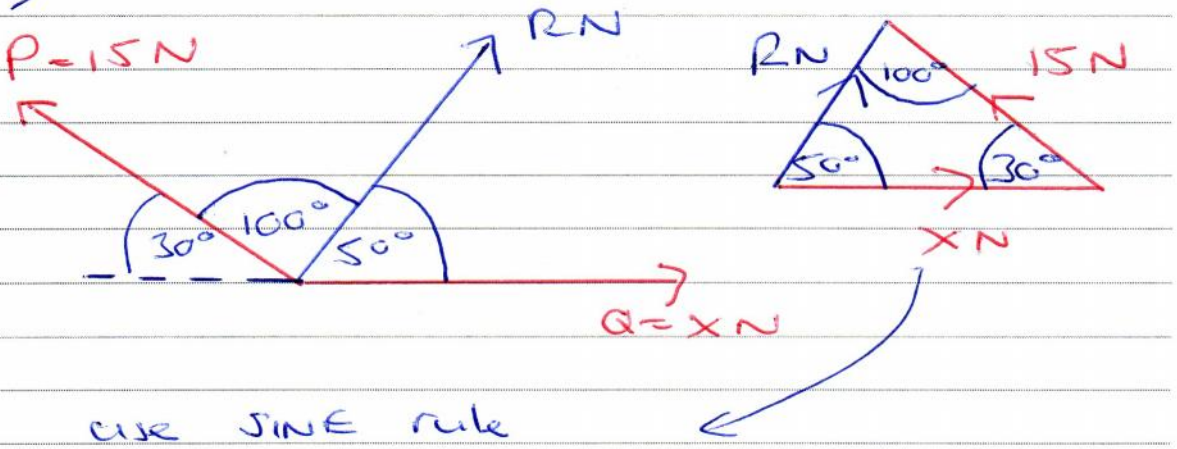
(a) the magnitude of **R**,

(4)

(b) the value of X.

(5)

a)



use SINE rule

$$\frac{R}{\sin 30^\circ} = \frac{15}{\sin 50^\circ}$$

$$\therefore R = \frac{15 \sin 30^\circ}{\sin 50^\circ}$$

$$= 9.7905\ldots$$

$$= 9.79 \text{ N} \quad (3\text{sf})$$

Question 5 continued

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b) using SINE rule

$$\frac{X}{\sin 100^\circ} = \frac{15}{\sin 50^\circ}$$

$$X = \frac{15 \sin 100^\circ}{\sin 50^\circ}$$

$$\therefore X = 19.283...$$

$$= 19.3 \text{ N} \quad (3 \text{ sf})$$

Q5

(Total 9 marks)