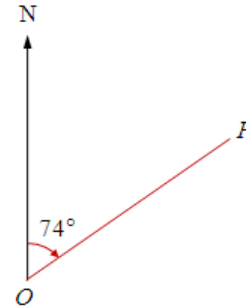


Applications of Trigonometry Bearing Problems

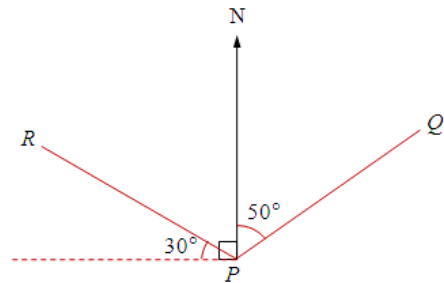
The **bearing** of a point P from a reference point O , is the 3-digit angle measured in a clockwise direction from the North (N) to the line OP .

The bearing of P from O is 074° .



1. Refer to the diagram and state the bearing of

- (a) Q from point P ,
- (b) P from point Q ,
- (c) R from point P ,
- (d) P from point R .



(a) Bearing of Q from point $P = 050^\circ$

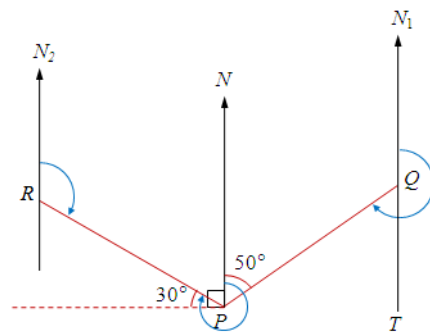
(b) $\angle PQT = 50^\circ$ (alt \angle s, $NP \parallel N_1T$)

$$\begin{aligned} \text{Bearing of } P \text{ from point } Q &= 180^\circ + 50^\circ \\ &= 230^\circ \end{aligned}$$

(c) Bearing of R from point $P = 270^\circ + 30^\circ = 300^\circ$

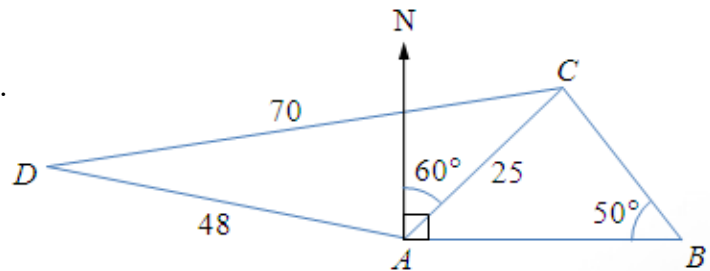
(d) $\angle NPT = 90^\circ - 30^\circ$ (comp \angle s)

$$\begin{aligned} \text{Bearing of } P \text{ from point } R &= 180^\circ - 60^\circ \text{ (int } \angle \text{s, } N_2R \parallel NP \text{)} \\ &= 120^\circ \end{aligned}$$



2. A, B, C and D are four points on level ground. The bearing of C from A is 060° .
 $AC = 25$ km, $AD = 48$ km, $CD = 70$ km, $\angle ABC = 50^\circ$ and B is due east of A .
 Calculate

- (a) distance AB ,
 (b) the bearing of D from A .



(a) $\angle CAB = 90^\circ - 60^\circ$ (comp \angle s)
 $= 30^\circ$

$$\angle ACB = 180^\circ - 30^\circ - 50^\circ \text{ (sum } \angle\text{s of } \Delta)$$

$$= 100^\circ$$

In ΔABC ,

$$\frac{AB}{\sin 100^\circ} = \frac{25}{\sin 50^\circ}$$

$$AB = \frac{25 \sin 100^\circ}{\sin 50^\circ}$$

$$= 32.1393$$

$$= 32.1 \text{ km (3 sf)}$$

(b) In ΔDAC ,

$$\cos \angle DAC = \frac{48^2 + 25^2 - 70^2}{2(48)(25)}$$

$$\angle DAC = \frac{25 \sin 100^\circ}{\sin 50^\circ}$$

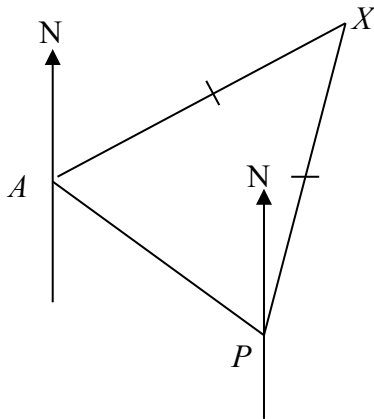
$$= 145.2101^\circ$$

$$\text{Bearing of } D \text{ from point } A = 360^\circ - (145.2101^\circ - 60^\circ)$$

$$= 274.7899$$

$$= 274.8^\circ \text{ (1 dp)}$$

3.

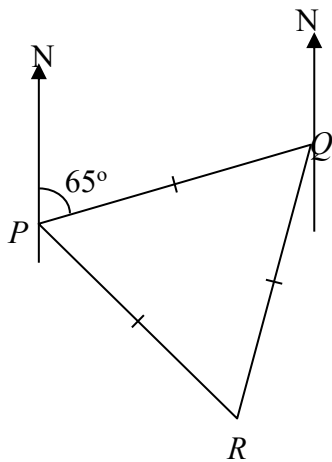


The bearing of A from P is 306° and the bearing of X from A is 050° . Given that $AX = PX$, calculate

- (a) $\angle XAP$,
- (b) the bearing of P from X .

(a) 76° (b) 202°

4.



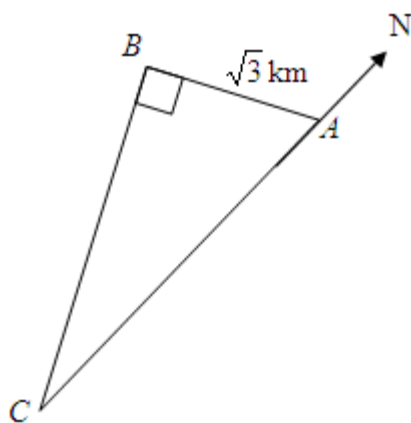
The points P , Q and R form an equilateral triangle the bearing of Q from P is 065° .

Find

- (a) the bearing of R from P ,
- (b) the bearing of R from Q ,
- (c) the bearing of P from R .

(a) 125° (b) 185° (c) 305°

5.



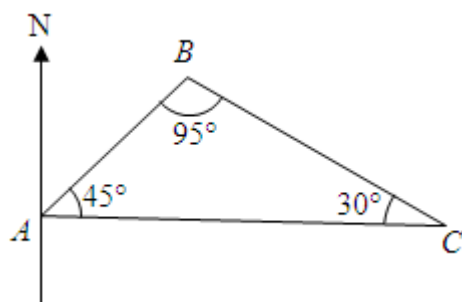
In the diagram, $\angle ABC = 90^\circ$. A is due North of C , the bearing of C from B is 145° and

$AB = \sqrt{3}$ km.

- (a) the bearing of B from A ,
- (b) the distance AC .

(a) 235° (b) $AC = 3.02$ km

6.



The figure shows the positions of A , B and C .

Find the bearing of

- (a) C from A ,
- (b) A from B ,
- (c) B from C .

(a) 100° (b) 225° (c) 310°