- ***Measure angle ADC***
- ***Measure angle BDA***

BEARING AND SCALE DRAWING

SUB TOPIC: Rotations/Revolutions/Complete turns

This is the act of turning around a centre or an axis

$$1\ complete\ turn/1\ rotation/1\ revolution\ =\ 360°$$

Examples

1. How many degrees are in two complete turns?

$$1\ turn = 360°$$
$$2\ complete\ turns = 360° \times 2$$
$$\equiv 720°$$

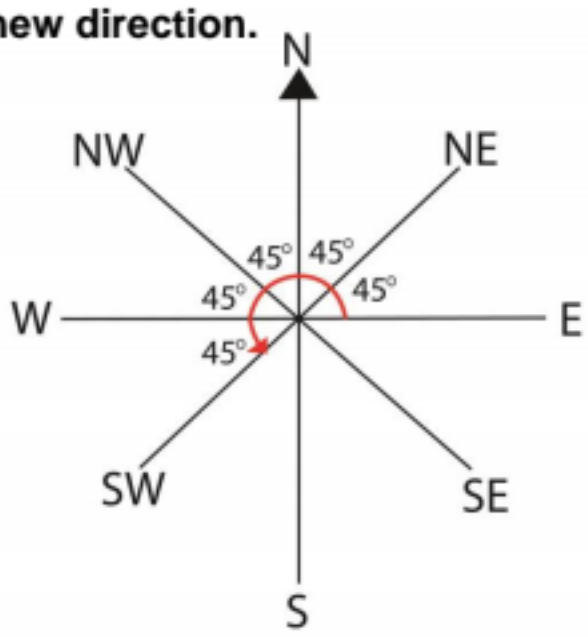
2. How many revolutions make up 1080^0?

$$360° = 1\ revolution$$
$$1080° = \frac{1080°}{360°}$$
$$= \frac{108}{36}$$
$$\equiv 3\ revolutions$$

3. **How many degrees are in $\frac{1}{2}$ turn?**
4. **A boy made 4 complete turns. Through what angle did he turn?**

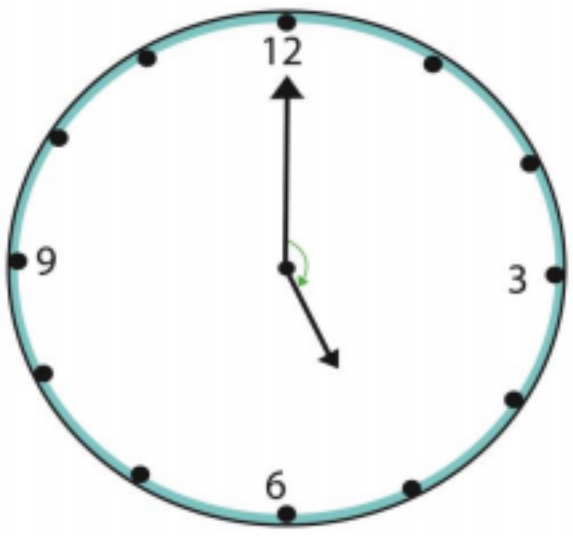
SUB TOPIC: Angles on a compass and a clock face

1. **Kakuru was facing in East and turned anticlockwise through an angle of 225^0. Find his new direction.**



His new direction became South West

2. **Calculate the smaller angle between the hands on the clock face below.**



$$\frac{25}{60} \times 360°$$
$$25 \times 6°$$
$$150°$$

3. **What angle can one turn after turning from South East to North in a clock wise direction?**

150°

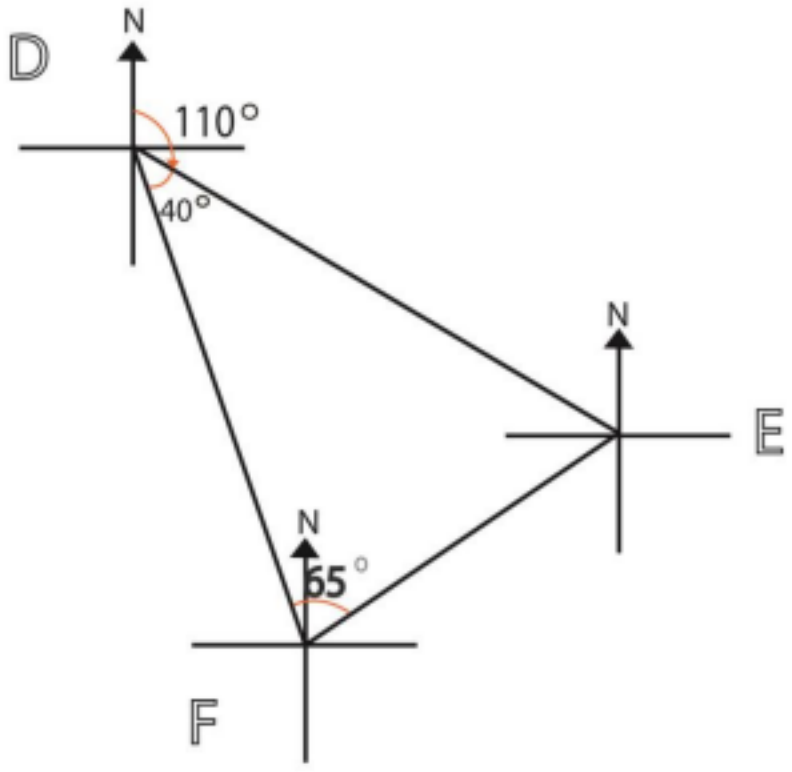
3. What angle can one turn after turning from South East to North in a clock wise direction?
4. What smaller angle is between West and North East?
5. Find the smaller angle between the North West and South West

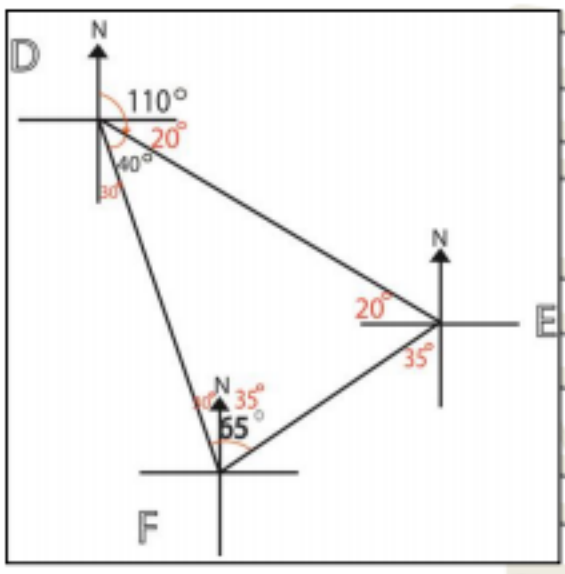
SUB TOPIC: Ordinary bearing (directions)

NOTE

- *Ordinary bearing (direction) is measured from either North or South but never from East or West*
- *The direction of P from Q is at point Q*

1. Study the diagram below and use it to answer the questions that follow





What is the direction of;

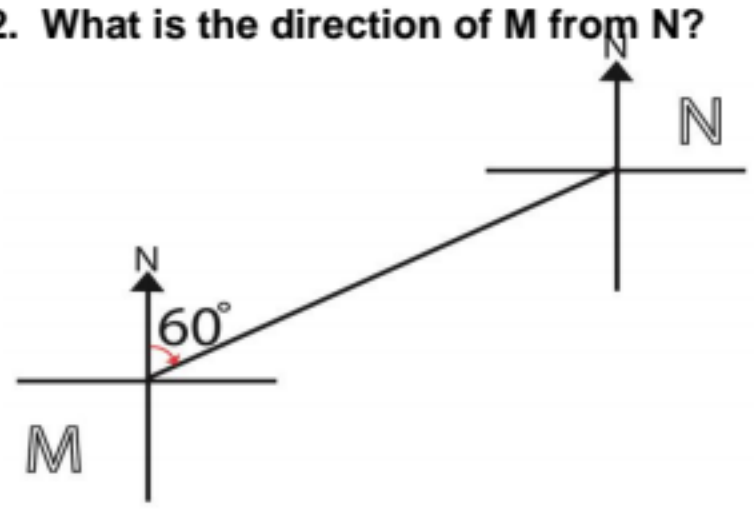
a) F from E
S35°W

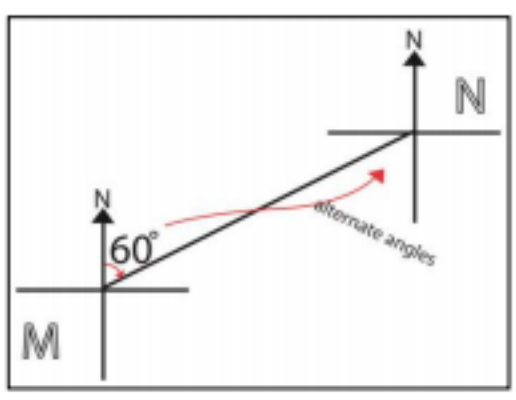
b) E from D
S70°E

c) D from F
N30°W

d) E from F
N35°E

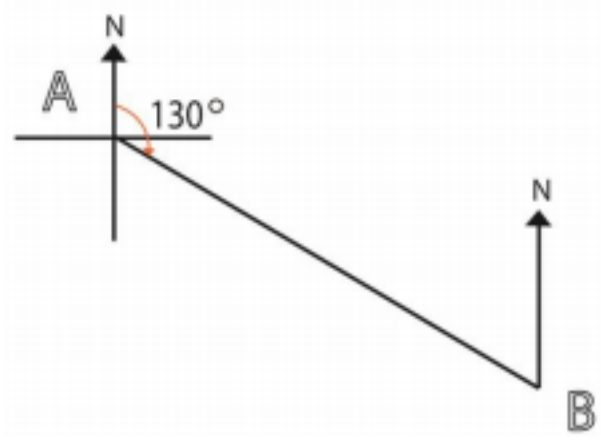
2. What is the direction of M from N?



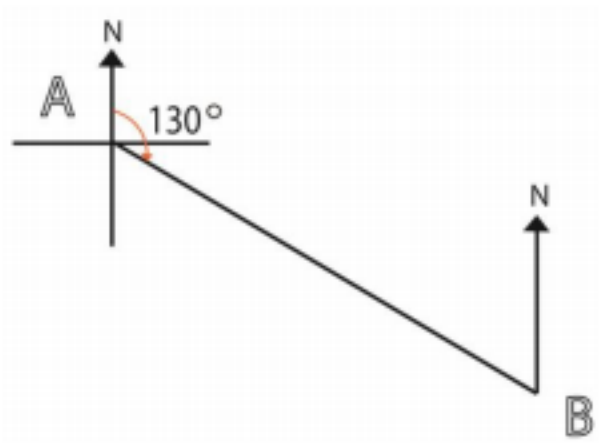


S60°W

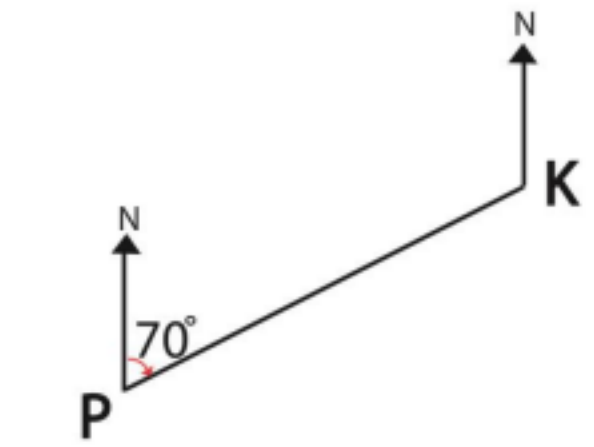
3. What is the direction of B from A?

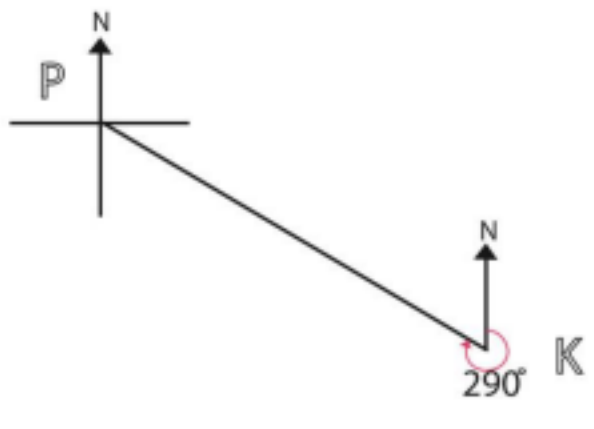


3. **What is the direction of B from A?**



4. **What is the direction of K from P?**



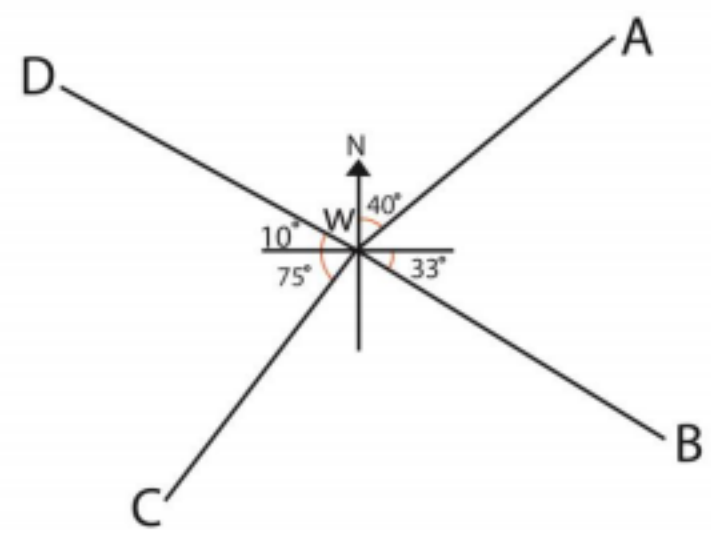


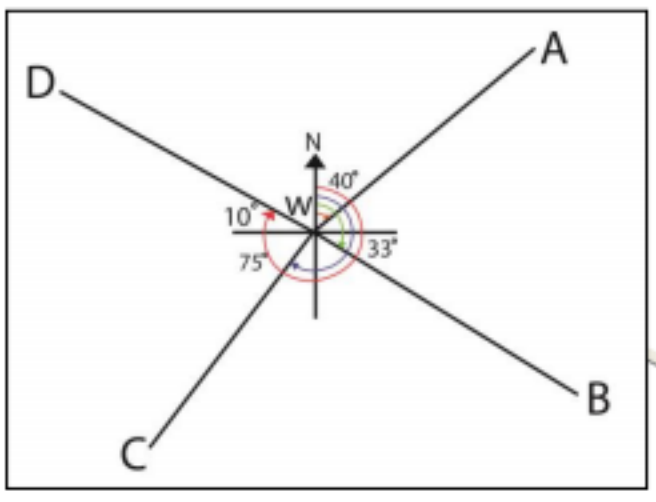
SUB TOPIC: True bearing

REMEMBER

- Bearing is measured from NORTH in a CLOCKWISE direction only.
- Bearing MUST be written in three digits i.e **030°, 000°, 126°** etc
- The bearing of NORTH is **000°, 360°**

1. Study the diagram below and use it to answer the questions that follow.





Find the bearing of;

a) **A from W**

$040°$

The bearing of A from W is 040°

b) **B from W**

$90° + 33° = 123°$

The bearing of B from W is 123°

c) **C from W**

$90° - 75° = 25°$

$180° + 25° = 205°$

The bearing of C from W is 205°

d) **D from w**

$90° + 90° + 90° + 10° = 280°$

The bearing of D from W is 280°

SUB TOPIC: More about true bearing

Examples

d) D from w

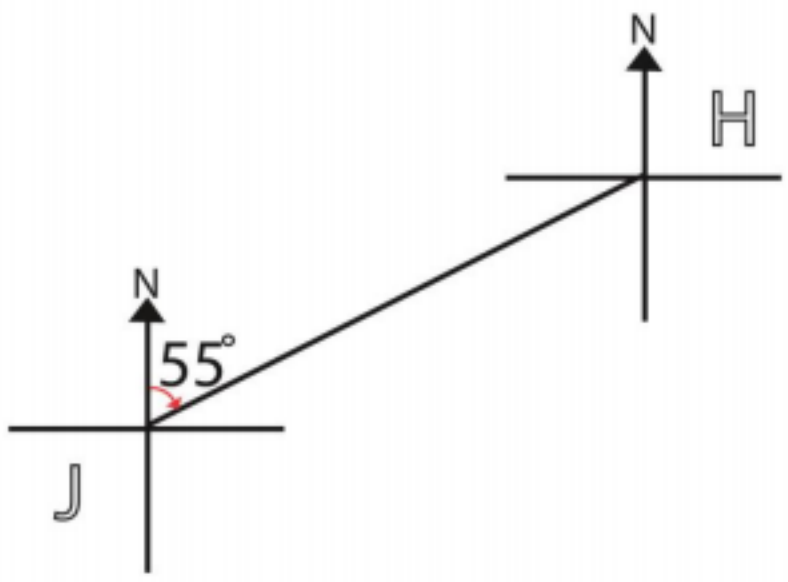
$90° + 90° + 90° + 10° = 280°$

The bearing of D from W is 280°

SUB TOPIC: More about true bearing

Examples

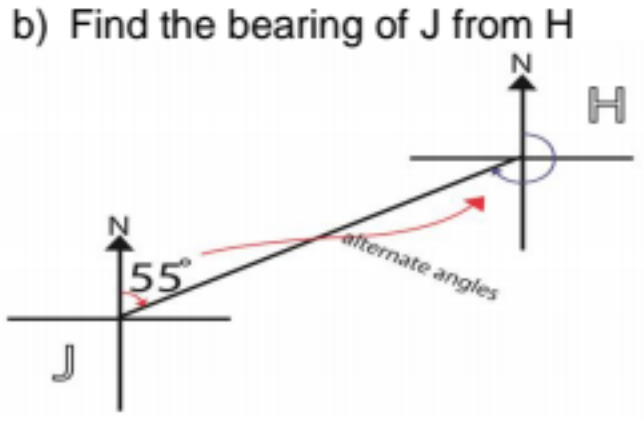
1. **Study the diagram below**



a) Find the bearing of H from J

The bearing of H from J is 055°

b) Find the bearing of J from H



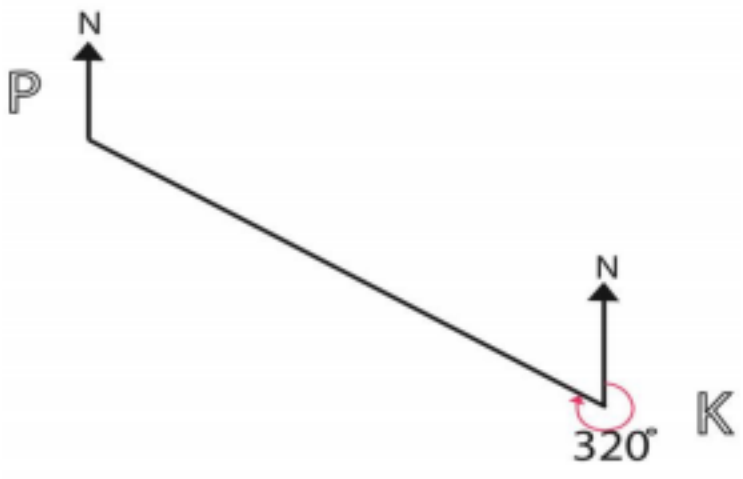
$90° + 90° + 55°$

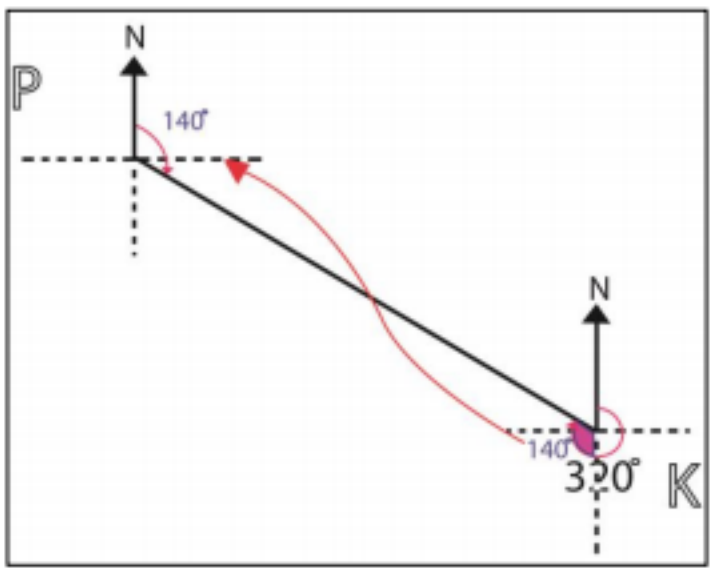
$180° + 55°$

$135°$

The bearing of J fro H is 235°

2. **Use the diagram below to find the bearing of K from P**

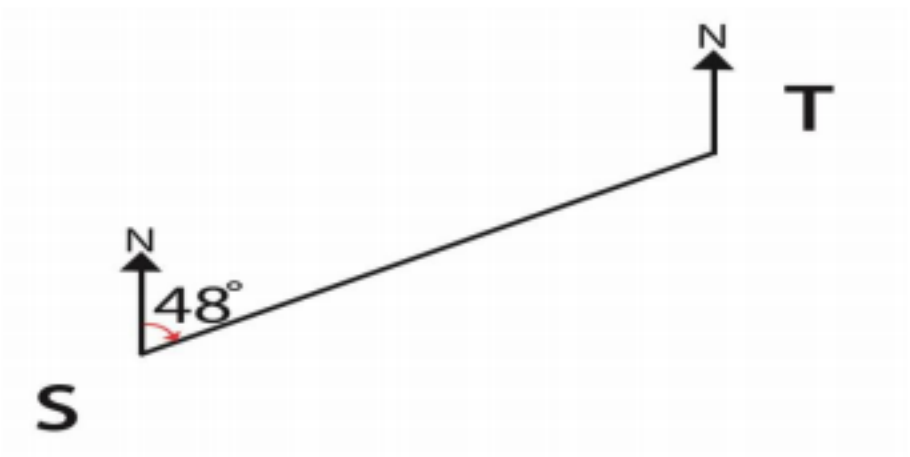




$320° - 180° = 140°$

The bearing of K from P is 140°

3. **Use the diagram below to find the bearing of S from T**



SUB TOPIC: Opposite bearing

NOTE

- When the given bearing is less than 180^0, to get its opposite bearing add 180^0 to it.
- When the bearing is greater than 180^0, subtract 180^0 from it.

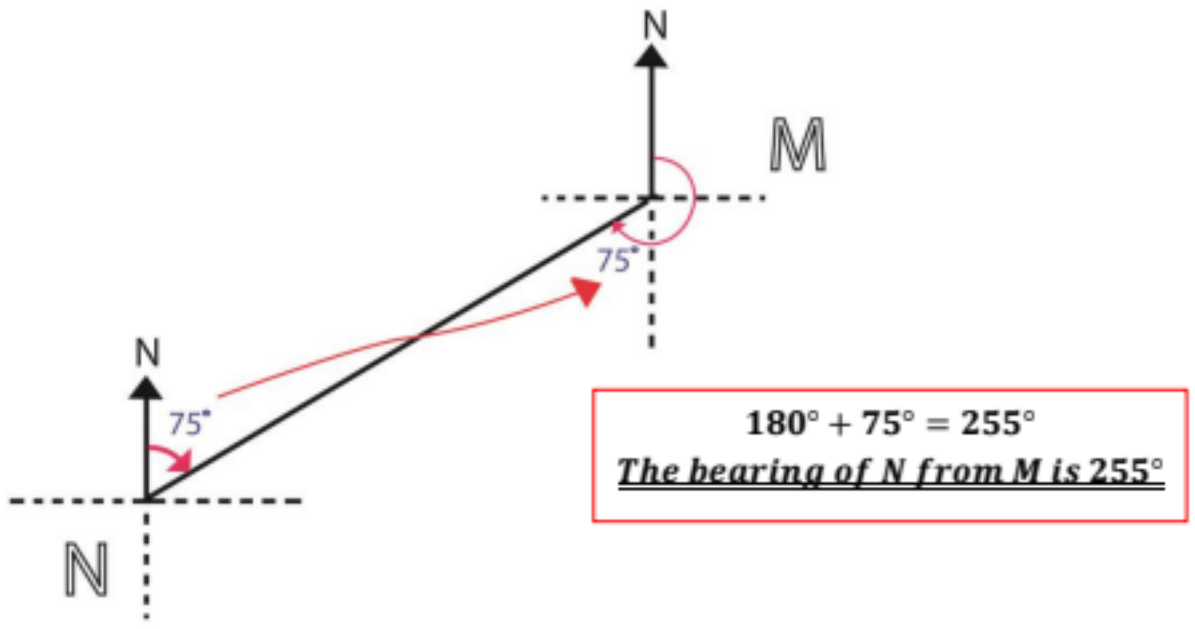
Try these

1. The bearing of A from B is 040^0. Find the bearing of B from A.

$$180° + 040° = 220°$$

The bearing of B from A is 220

2. **The bearing of M from N is 075^0. Find the bearing of N from M. (use a diagram)**



$$180° + 75° = 255°$$

The bearing of N from M is 255°

3. The bearing of X from Y is 300^0. Find the bearing of Y from X.

$$300° - 180° = 120°$$

The bearing of Y from X is 120°

4. **The bearing of K from P is 050^0. Find the bearing of P from K.**
5. **The bearing of B from C is 250^0. Find the bearing of C from B**

SUB TOPIC: Expressing distance in a given scale

Examples

SUB TOPIC: Expressing distance in a given scale

Examples

1. The distance between two towns on a map is 3.5cm. Find the actual distance on the ground in km if the scale is 1:100,000.

$1cm\ represents\ 100,000cm$

$3.5cm\ represent\ 3.5 \times 100,000cm$

$\underline{350,000cm}$

cm to km

$100,000cm = 1km$

$350,000cm = \frac{350,000}{100,000}km$

$\underline{= 3.5km}$

$\underline{The\ actual\ distance\ is\ 3.5km}$

2. **The actual distance between village A and B is 8.5 km. Find the distance between the two towns on a map if the scale is 1:1000,000.**

km to cm

$1km = 100,000cm$

$8.5km = 8.5 \times 100,000cm$

$\underline{= 850,000cm}$

$1,000,000cm\ represent\ 1cm$

$850,00cm\ represent\ \frac{850,000}{1,000,000}$

$\underline{0.85cm}$

$\underline{The\ distance\ on\ the\ map\ is\ 0.85cm}$

3. The distance between two ports on a map is 6cm. Calculate the scale used on that map if the actual distance is 120km on the ground.

km to cm

$1km = 100,000cm$

$120km = 120 \times 100,000cm$

$\underline{= 12,000,000cm}$

$6cm : 12,000,000cm$

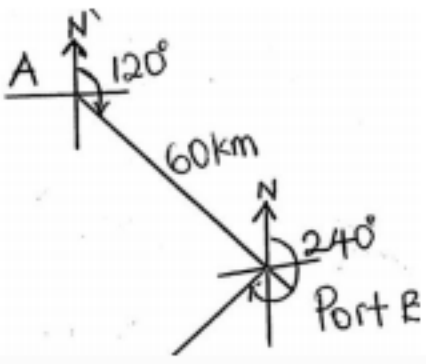
$\frac{6cm}{6cm} : \frac{12,000,000cm}{6cm}$

$\underline{1 : 2,000,000}$

4. The distance between the church and the hospital on the map is 4.5cm. find the actual distance on the ground if 1cm represents 80m.

SUB TOPIC: Scale drawing

1. **A ship left port A for port B on a bearing of120^0 a distance of 60km. it then continued to port C on a bearing of 240^0 a distance of 75km. Using a scale of 1cm:10km. Draw an accurate diagram to show the three ports.**

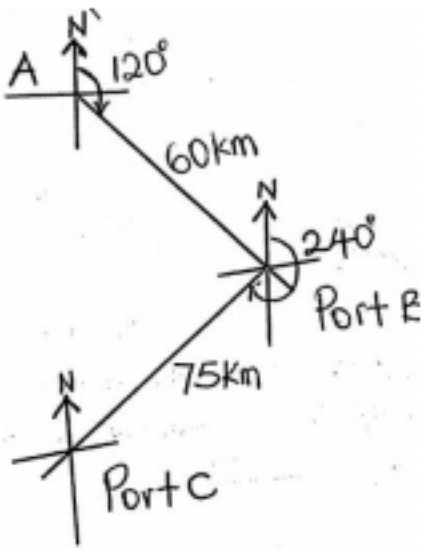


1cm represents 10km	
60km	$60km \div 10km = 6cm$
75km	$75km \div 10km = 7.5cm$

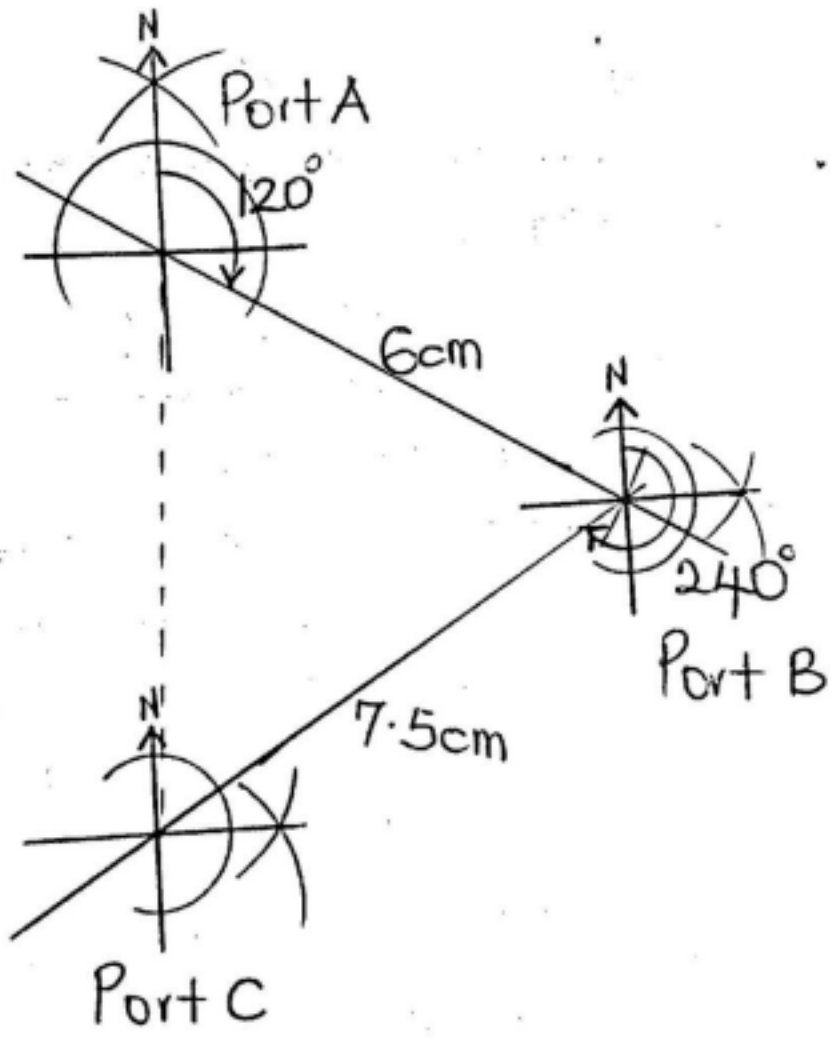
4. The distance between the church and the hospital on the map is 4.5cm. find the actual distance on the ground if 1cm represents 80m.

SUB TOPIC: Scale drawing

1. **A ship left port A for port B on a bearing of120^0 a distance of 60km. it then continued to port C on a bearing of 240^0 a distance of 75km. Using a scale of 1cm:10km. Draw an accurate diagram to show the three ports.**

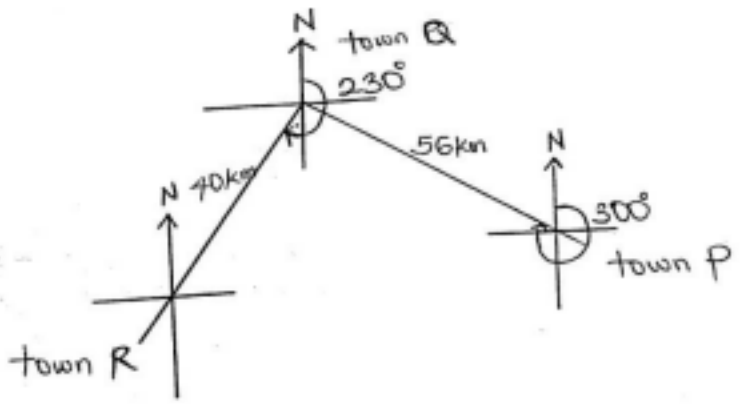


1cm represents 10km	
60km	$60km \div 10km = 6cm$
75km	$75km \div 10km = 7.5cm$



- ***Find the shortest distance from port A to port C.***
- ***Find the bearing of port A from port C***

2. **A driver drove from town P on a bearing of 300^0 to town Q for a distance of 56km. the driver left town Q and drove on a bearing of 230^0 to town R for a distance of 40km.**
   Using a scale of 1cm to represent 8km, draw an accurate diagram to show the route of the driver.



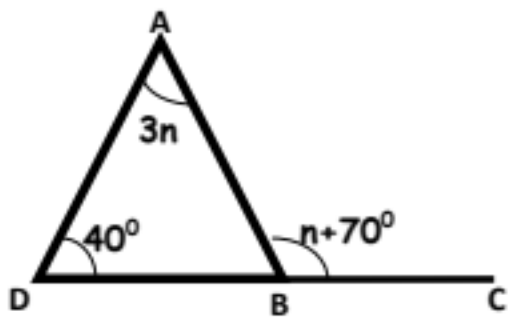
1cm represents 8km	
56km	$56km \div 8km = 7cm$
40km	$40km \div 8km = 5cm$

- Find the shortest distance from town P to town R.
- **Find the bearing of Town R from Town P.**

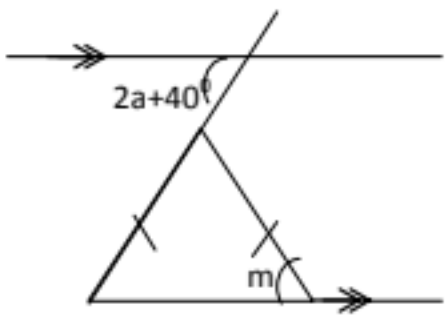
TOPICAL REVISION QUESTIONS:

1. With the help of a ruler and pair of compasses only, construct the following angles.
   (a) 30^0
   (b) 45^0
   (c) 75^0
   (d) 120^0

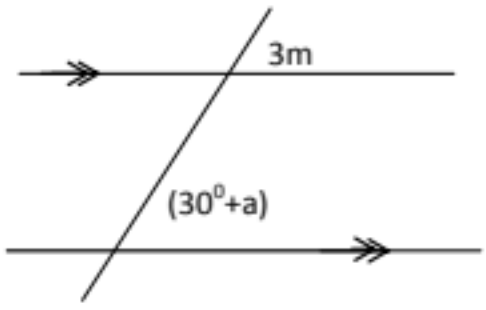
2. Construct using a ruler and pair of compasses only the triangles with the following measurement.
   (a) Triangle ABC where AB = 7cm, AC = 6cm and BC = 5cm
   (b) Triangle PQR where PQ = 8cm, $\angle Q = 120^0$ and QR = 5cm. Measure PR
3. What is the smaller angle between West and South West.
4. The bearing of a village P from town K is 049. What is the bearing of town K from village P.
5. Construct a square WXYZ whose sides are 4.5cm.
6. Each interior angle of a regular polygon is 120.
   (iii) Find the number of sides of the polygon.
   (iv) Calculate its interior angle sum.
7. How many degrees will Munduni turn through in 3 ¼ revolutions?
8. Town B is 60km South of town A and town C is 80km East of town B. Draw an accurate diagram for the 3 towns and measure the shortest distance between A and C
9. In the triangle ABC below, find the value of **n**



10. The supplement of $(a+30)^0$ is 40^0, find the value of **a**
11. From the diagram below, angle m = 3a. Find the value of a



12. Given that m = 2a, find the value of a in degrees.



13. Calculate the size of angle w, x, y, z