BEARINGS

1. A car is 120 metres from the foot of the building 80 metres high. Determine the angle of elevation of the top of the building from the car.

2. A man standing 20m away from a tall building finds that the angle of elevation of the top of the building is 60^0 and the angle of depression of the foot of the building is 40^0. Calculate the height of the building.

3. Martha is looking at the top of the building which is on the ground level with her .The angle of elevation to the top of the building is **32^0** .if she then walks distance off **30m** towards the building ,her angle of elevation changes to **45^0** . if Martha is **2.3m** tall,
   i). how far was she when she started moving.
   ii) How high is the building.

4. At a certain point on a level ground road , the angle of depression of the pickup truck from the top of tower is **28^0**.At another point **100m** away from the first point , the angle of depression of the truck is now **35^0. Find : i)** How far was the truck from the tower at the first point
   ii) How high is the tower

5. A man of height 1.5m is standing on the roof of his house ,which is 10m high. He can see acar on the ground at n angle of 45^0.Beyond the car stands a mast 40m high . if the top of the mast is at an angle of elevation of 30^0 from the man ,calculate
   i) How far is the car from the house
   ii) How far is the house from the mast
   iii) How far the mast is from the car

6. Two points P and Q are on a level ground and on opposite sides of a flag pole $5\sqrt{3}$ m tall. P is 5m from the foot of the pole and the angel of elevation of eh top of the flag pole from point Q is 45°. **Calculate;**

   (a) the angle of elevation of the top of the flag pole from point P.

   (b) How far is Q from the foot of the pole?

   (c) How far is P from Q?

7. Three points P, Q, R are on the same ground level. A vertical pole NM stands in between P and Q such that N is the foot of the pole. The angles of elevation of P and Q from the top of a pole M are 33^0 and 56^0 respectively. Given that NQ = 25 metres, PR = 12 metres and angle QPR = 79^0. Calculate:
   (i) Height of the vertical pole. (iii)Length of PQ
   (ii) Angle of elevation of R from M.

8. Two ships leave K harbour at the same time. One ship sails 60km on a bearing of 030° to position P. The other ship sails 100km on a bearing of 110° to position Q.

(a) Calculate (i) distance PQ (ii) angle KPQ (iii) the bearing of Q from P

(b) Both ships take t hours , to reach their positions . The speed of the faster ship is 20 km/h. Find the
(i) value of t. (ii) speed of the slower ship

9. (a) In the triangle **MLN,** length **ML=8cm, LN=6cm** and **LP=hcm** is the altitude of triangle LMN and perpendicular to **MN**, angle MLN = 90^o. Find
   (i) The value of **h**
   (ii) The area of triangle MLN

(a) Building A is 40 metres high. The angle of depression of the top of building B from the top of A is 26º. Given A and B are 10m apart, find the height of building B ***(Give your answer to 2 decimal places)***

10. Four towns P,Q R and S are such that town Q is 120km due east of town P. Town R is 160km due north of town Q, town S is on a bearing of 330^0 from P and on a bearing of 300^0 from R.(a) Using a scale of 1cm: 50km, determine, (i) the distance SP

    (ii) the distance SR
    (iii) the bearing of town S from town Q.

11. Four towns A, B, C and D are such that town B is 300km away from A on a bearing of N60°E. Town C is 500 km away on a bearing of 150° from B and town D is 200km due west of town C.

(a) Sketch a diagram to show the position of the four towns

(b) Using a scale of 1cm: 50km, draw an accurate diagram to show the position of the four towns.

(c) Using your diagram in (b) above, find the distance and bearing of town A from D.

(d) if a plane flies directly from A to D at a speed of 20km/h.how will it take on the way?.

12. Town B is 120 km on a bearing of 080° from town A. Town C is 140 km on a bearing of 150° from B while town D is 240 km due north of town C.
    (a) Draw an accurate scale diagram to show the relative positions of the four towns (use a scale of 1 cm to 20 km)
    (b) Find the bearing and distance of A from D
    (c) If a motorist drives at 100 kmh $^{-}1$ between A and B, at 80 kmh $^{-1}$ between B and C and at 120 kmh $^{-1}$ between C and D, find his average speed for the whole journey from A to D.

13. A plane flew due West from Port A at a speed of 280 kmh^{-1} for ¾ hours to Port B. It then altered its course and flew North West to Port C at a speed of 220 kmh^{-1}. From there, it flew on a bearing of 060° to Port D at 240 kmh^{-1} for 1½ hours. The total time of flight was 4½ hours.
    (i) By scale drawing, using a scale, 1 cm to 50km, determine the distance and bearing of Port A from Port D.

    (ii) Determine how long it will take the plane to fly directly from A to D and back to A at a speed of 220kmh^{-1}.

14. Two ships leave Mombasa port M at the same time. One ship sails 500 km on a bearing of 030^0 to position A. The other ship sails 300 km on a bearing of 300^0 to position B. Use a scale of 1cm : 50 km to find
    (i) The distance AB
    (ii) The angle MAB
    (iii) The bearing of B from A

15. A rally driver drives from town K due west for 180km to town L one day one. The next day he heads toward town M , 252km away on a bearing of 320^0 from town L. He then changes course the following day and drives 448km on a bearing of 060^0 to town N.

    (a) Draw a sketch showing the journey of the driver.
    (b) Calculate (i) the distance between towns N and M
        (ii) the bearing of town M from N

(b) If he drives back to town K directly from town N at an average speed of 110km/h, find how long it took him in hours.

16. Two aero planes P and Q leave an airport at the same time. P flies on a bearing of 240^{O} at 900km/h while Q flies due East at 750km/h.

(a)Using a scale of 1cm to represent 100km, draw an accurate diagram showing the positions of the two aero planes after 1hour 20minutes.

(b) From the diagram in (a) above determine: (i) the distance between the two aero planes

(ii) bearing of P from Q

(iii) the bearing of Q from P.

17. A plane flies from airport A to airport B, at a speed of 900km/h for 40 minutes on a bearing of $S45^{0}E$. From B it changes course and flies to airport C which is due South of A.

(a) Using a scale of 1cm: 50km determine

(i) how far airport C is from airport B

(ii) how far airport A is from airport C

(iii) the bearing of C from B.

18. sA helicopter is at airport H on a bearing of 060^{0} and 800km from another airport P. A third airport J is on a bearing of 135^{0} and 1450km from H.

a) Using a scale of 1cm to represent100km;

(i) Show the relative positions of P, H and J

(ii) Determine the distance between P and J

(iii) What is the bearing of P from J.

b) A jet flying at a speed of 620km/hr left J towards P. At the same time the helicopter at H took off towards P. Find the speed at which the helicopter will fly so as to arrive at P, 50 minutes earlier than the jet.