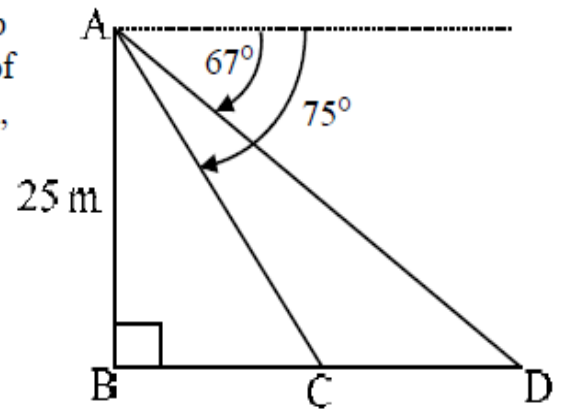


2D PROBLEMS

The angle of depression: It is an angle between horizontal line from an observer and their line of sight to an object below the horizontal. It is formed when observer looks downwards.

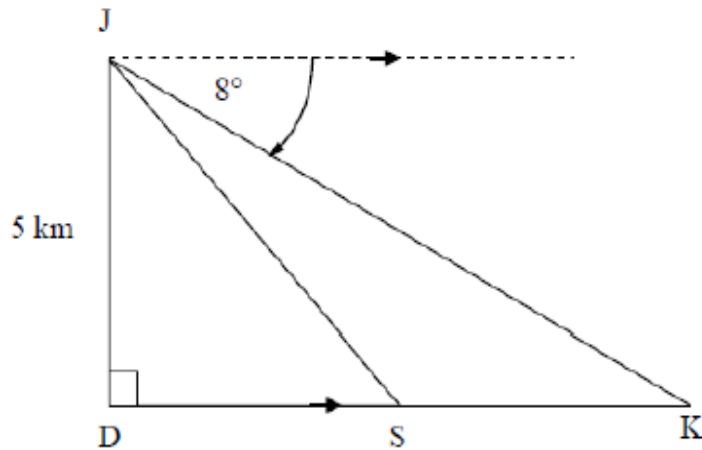
The angle of elevation: It is an angle between horizontal line from an observer and their line of sight to an object above the horizontal. It is formed when observer looks upwards.

- (i) In the accompanying figure AB represents a lamp pole with height 25 m. Two cables from the top of the pole, are anchored at points C and D. From A, the angles of depression of C and D in the same horizontal line as B are 75° and 67° . Calculate the distance (CD) between the two anchor points.



PASR EXAMINATION PAPERS

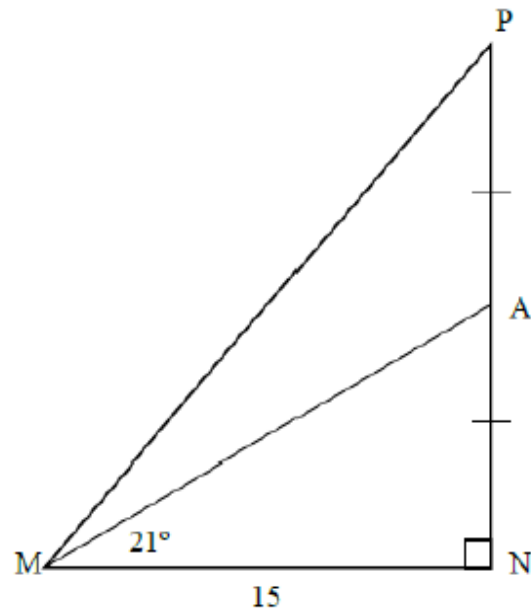
- 5.2 An aeroplane at J is flying directly over a point D on the ground at a height of 5 kilometres. It is heading to land at point K. The angle of depression from J to K is 8° . S is a point along the route from D to K.



- 5.2.1 Write down the size of \hat{JKD} . (1)
- 5.2.2 Calculate the distance DK, correct to the nearest metre. (3)
- 5.2.3 If the distance SK is 8 kilometres, calculate the distance DS. (1)
- 5.2.4 Calculate the angle of elevation from point S to J, correct to ONE decimal place. (2)
- [16]**

QUESTION 5

- 5.1 In the sketch below, $\triangle MNP$ is drawn having a right angle at N and $MN = 15$ units. A is the midpoint of PN and $\hat{AMN} = 21^\circ$.

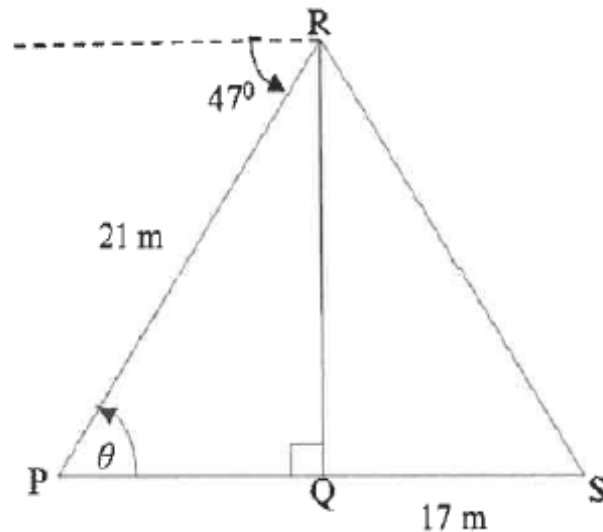


Calculate:

- 5.1.1 AN (3)
- 5.1.2 \hat{PMN} (3)
- 5.1.3 MP (3)
- 5.2 Calculate θ if $2\sin(\theta + 15^\circ) = 1,462$ and $0^\circ \leq \theta \leq 90^\circ$. (3)
- [12]**

QUESTION 6

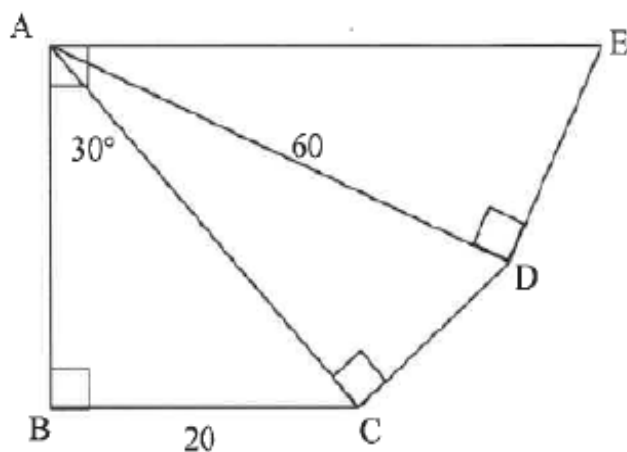
RQ is a vertical pole. The foot of the pole, Q, is on the same horizontal plane as P and S. The pole is anchored with wire cables RS and RP. The angle of depression from the top of the pole to point P is 47° . PR is 21 m and QS is 17 m. $\hat{RPQ} = \theta$.



- 6.1 Write down the size of θ . (1)
- 6.2 Calculate the length of RQ. (3)
- 6.3 Hence, calculate the size of \hat{S} . (2)
- 6.4 If P, Q and S lie in a straight line, how far apart are the anchors of the wire cables? (4)
- [10]**

QUESTION 4

- 4.1 In the diagram below, ABC , ACD and ADE are right-angled triangles.
 $\hat{BAE} = 90^\circ$ and $\hat{BAC} = 30^\circ$. $BC = 20$ units and $AD = 60$ units.



Calculate the:

- 4.1.1 Length of AC (2)
- 4.1.2 Size of \hat{CAD} (2)
- 4.1.3 Length of DE (3)
- 4.2 Solve for x , correct to ONE decimal place, where $0^\circ \leq x \leq 90^\circ$:
- 4.2.1 $\tan x = 2,01$ (2)
- 4.2.2 $5 \cos x + 2 = 4$ (3)

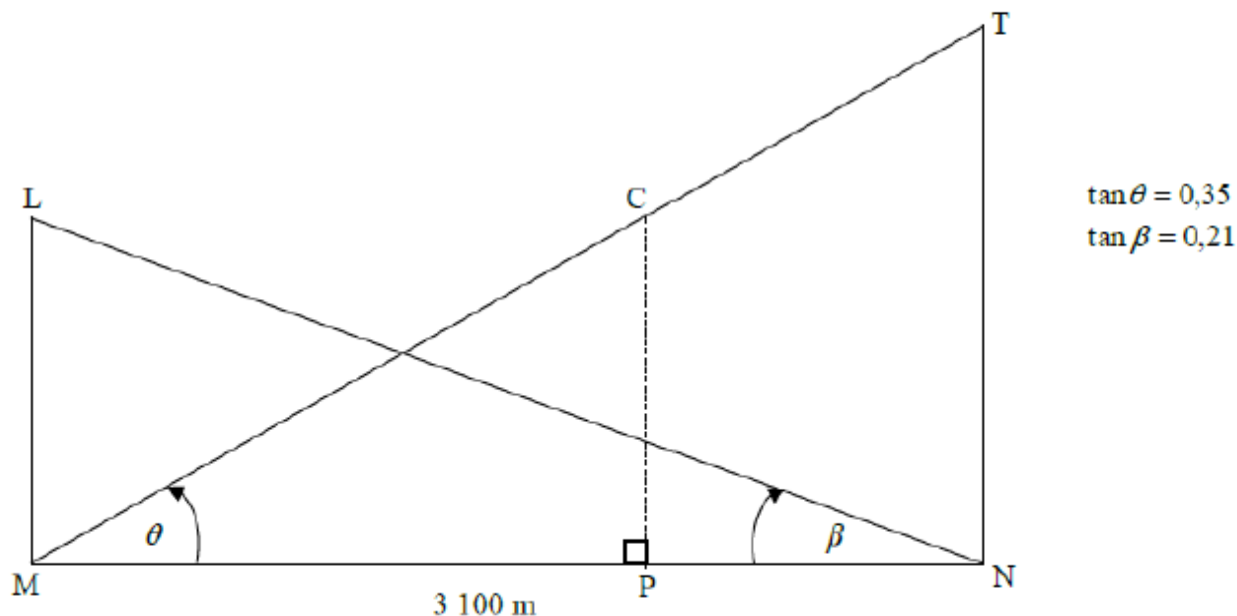
QUESTION 7

The diagram below represents a cross-section of the peaks of Table Mountain, T, and Lions Head, L, above sea level. Points M and N are directly below peaks L and T respectively, such that MPN lies on the same horizontal plain at sea level and P is directly below C.

$MN = 3\,100$ m.

The angle of elevation of L from N is β and the angle of elevation of T from M is θ .

It is given that $\tan \theta = 0,35$ and $\tan \beta = 0,21$.



7.1 Calculate the ratio of LM : TN. (4)

7.2 A cable car, C, travelling from the top of Table Mountain, T, follows a path along TCM.

7.2.1 Calculate the angle formed (\widehat{MTN}) between the cable and the vertical height TN. (2)

7.2.2 If the cable car, C, travels along the cable, such that $TC = 400$ m, calculate the height of the cable car above sea level at that instant. (5)
[11]