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IG - Maths

0580

Trigonometry

Exercise: Paper-4

SP-20; M-19; M-18

S-19; S-18

W-18

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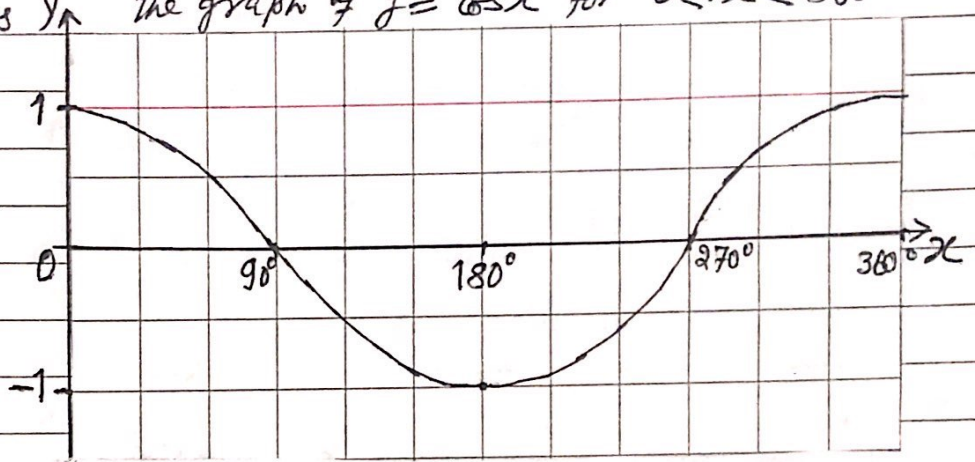
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INDIA.



1. The grid shows $y = \cos x$ for $0 \leq x \leq 360^\circ$



(a) Solve the equation $3 \cos x = 1$ for $0 \leq x \leq 360^\circ$

Give your answers correct to 1 decimal place. --- [4]

(b) On the same grid, sketch the graph of $y = \sin x$ for $0 \leq x \leq 360^\circ$

[SP-20/04/Q8] --- [2]

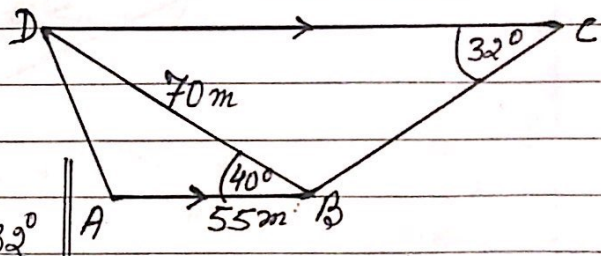
2. The diagram shows a

trapezium ABCD.

AB parallel to DC.

AB = 55m, BD = 70m,

angle ABD = 40° and angle BCD = 32°



(a) Calculate AD. --- [4]

(b) Calculate BC. --- [4]

(c) Calculate the area of ABCD. --- [3]

(d) Calculate the shortest distance from A to BD. [SP-20/04/Q9] --- [2]

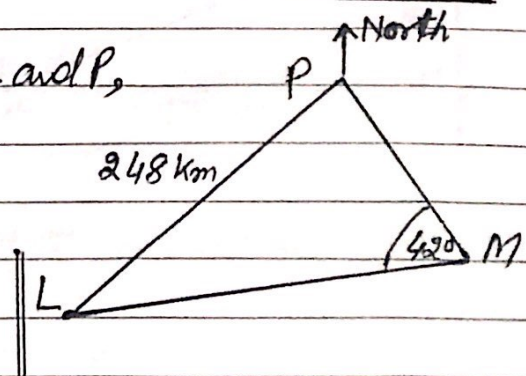
3. The diagram shows two posts L and P,
and a buoy, M.

The bearing of L from P is 201° ,

and LP = 248 km.

The bearing of M from P is 127°

Angle PML = 42°



(a) Use sine rule to calculate LM. --- [4]

(b) A ship sails directly from L to P.

(i) Calculate the shortest distance from M to LP. (Continued) --- [3]



(continued →)

- 3(b) (ii) The ship leaves L at 2045 and travels at a speed of 40 km/h. Calculate the time the next day that ship arrives at P.

[M-18/42/Q8] -- [3]

4. The diagram shows a field ABCDE.

- (a) Calculate the perimeter of the field ABCDE.

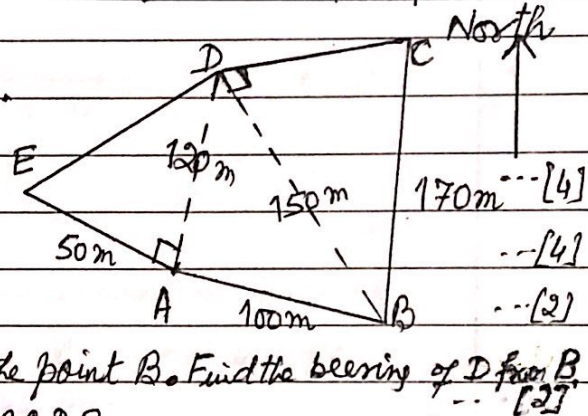
- (b) Calculate angle ABD.

- (c) (i) Calculate angle CBD.

(ii) The point C is due north of the point B. Find the bearing of D from B.

- (d) Calculate the area of the field ABCDE.

Give your answer in hectares.



[S-19/41/Q3] -- [4]

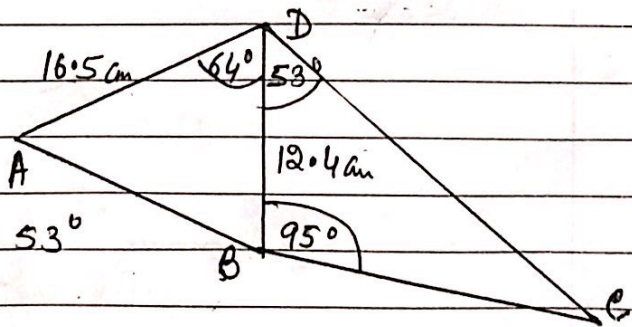
5. The diagram shows two triangles ABD and BCD.

$AD = 16.5 \text{ m}$ and $BD = 12.4 \text{ m}$.

Angle $ADB = 64^\circ$, angle $BDC = 53^\circ$ and angle $DBC = 95^\circ$

- (i) Find AB.

- (ii) Find BC.



[S-19/42/Q8(a)] -- [4]

6(a) In the diagram, BC is a vertical wall standing on a horizontal ground AB.

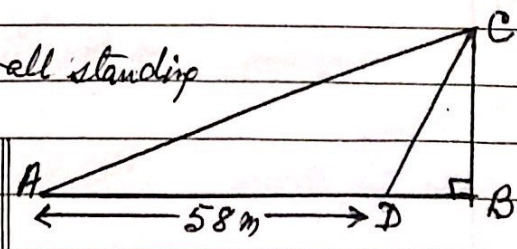
D is a point on AB, where $AD = 58 \text{ m}$.

The angle of elevation of C from A is 26° .

The angle of elevation of C from D is 72° .

- (i) Show that $AC = 76.7 \text{ m}$, correct to 1 decimal place.

- (ii) Calculate BD.



(b) Triangle EFG has an area of 70 m^2 .

$EF : FG = 1 : 2$ and angle $EFG = 40^\circ$

- (i) Calculate EF.

(continued →)



(continued →)

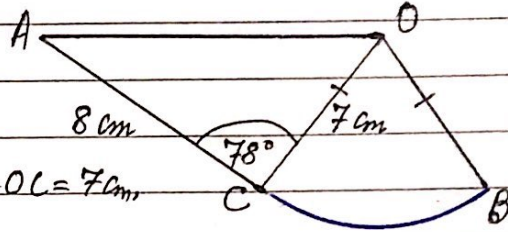
6(b) (ii) A different triangle PQR also has an area of 70m^2 .

PQ : QR = 1 : 2 and PQ = EF.

Find angle PQR.

S-19/43/Q9 --- [1]

7. The diagram shows a design made from a triangle ADC joined to a sector OCB, $AC = 8\text{cm}$, $OB = OC = 7\text{cm}$ and angle $ACO = 78^\circ$



(a) Use the cosine rule to show that $OA = 9.47\text{cm}$, correct to 2 decimal places [4]

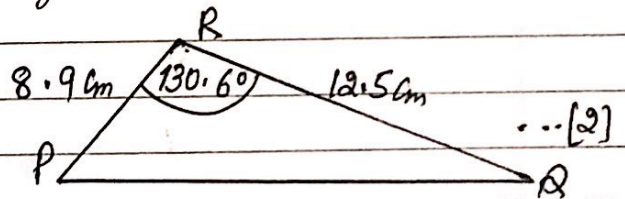
(b) Calculate angle OAC. --- [3]

(c) The perimeter of the design is 29.5cm .

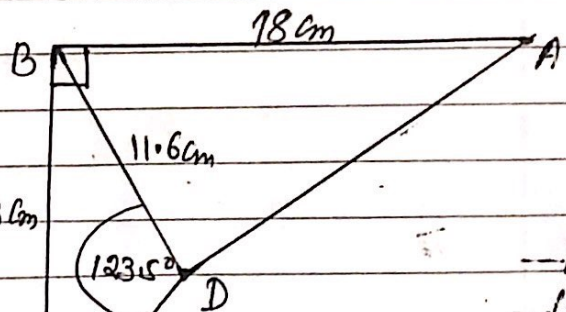
Show that angle $COB = 41.2^\circ$, correct to 1 decimal place --- [5]

(d) Calculate the total area of the design. S-18/42/Q5 --- [4]

8. (a) Calculate the area of triangle PQR.



(b) In the diagram, $AB = 18\text{cm}$, $BC = 21.3\text{cm}$, and $BD = 11.6\text{cm}$, angle $BDC = 123.5^\circ$ and angle ABC is a right angle.



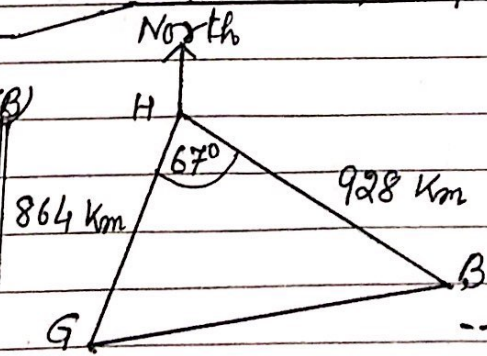
(i) Calculate angle BCD. --- [3]

(ii) Calculate AD. --- [5]

W-18/41/Q7

9. The diagram shows the position of three cities, Geneva (G), Budapest (B) and Hamburg (H).

(a) A plane flies from Geneva to Hamburg. The flight takes 2 hours 20 minutes. Calculate the average speed in kilometres per hour.



(continued →)



(continued →)

9(b) Use the cosine rule to calculate the distance from Geneva to Budapest. [4]

(c) The bearing of Budapest from Hamburg is 133° .

(i) Find the bearing of Hamburg from Budapest. -- [2]

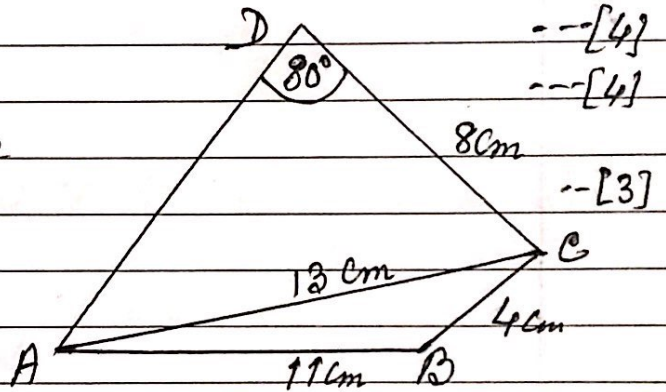
(ii) Calculate the bearing of Budapest from Geneva. -- [4]

[W-18/42/Q8]

10(a) Calculate angle ACB.

(b) Calculate angle ACD

(c) Calculate the area of the quadrilateral ABCD.

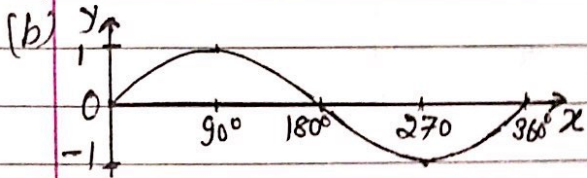


[W-18/43/Q6]



Answers

1 (a) 70.5 and 289.5



2. (a) 45.0 (b) 84.9 (c) 4060 (d) 35.4

3. (a) 356 (b) (i) 320 (ii) 0257 am.

4 (a) 530 (b) 52.9

(c) (i) 28.1 (ii) 331.9 (d) 1.5

5. (i) 15.7 (ii) 18.7

6. (a) (i) $\angle ACD = 46^\circ$, $\angle ADC = 108^\circ$

$$AC = \frac{58 \times \sin 108^\circ}{\sin 46^\circ} = 76.68^\circ \checkmark$$

(ii) 10.9

(b) (i) 10.4 (ii) 140

7. (a) $OA^2 = 8^2 + 7^2 - 2 \times 7 \times 8 \cos 78^\circ$
 $\rightarrow OA = 9.47$

(b) 46.3

(c) length of arc B $l = 29.5 - (7 + 8 + 9.47)$

$$\angle COB = \frac{360 \times l}{2\pi \times 7} = 41.05^\circ \checkmark$$

(d) 45

8. (a) 42.2

(b) (i) 27.0 (ii) 15.9

9 (a) 370

(b) 991

(c) (i) 313

(ii) 079.5

← X — X →