Trig Test #1 Review **Please complete the work on a separate sheet of paper.**

1. The diagram below shows a quadrilateral ABCD with obtuse angles $A\hat{B}C$ and $A\hat{D}C$.

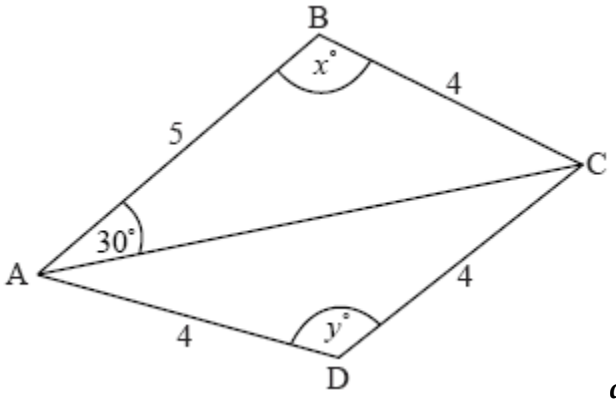


diagram not to scale

AB = 5 cm, BC = 4 cm, CD = 4 cm, AD = 4 cm, $B\hat{A}C = 30°$, $A\hat{B}C = x°$, $A\hat{D}C = y°$.

(a) Use the cosine rule to show that AC = $\sqrt{41-40\cos x}$.

(1)

(b) Use the sine rule in triangle ABC to find another expression for AC.

(2)
(Total 3 marks)

2. The following diagram shows the triangle ABC.

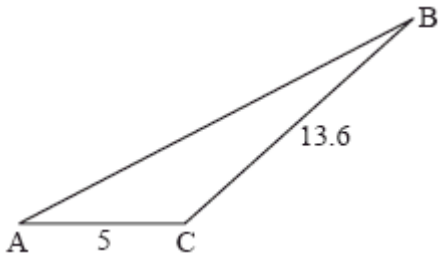


diagram not to scale

The angle at C is obtuse, AC = 5 cm, BC = 13.6 cm and the area is 20 cm^2.

(a) Find $A\hat{C}B$.

(4)

(b) Find AB.

(3)
(Total 7 marks)

3. The diagram below shows a triangle ABD with AB = 13 cm and AD = 6.5 cm.
Let C be a point on the line BD such that BC = AC = 7 cm.

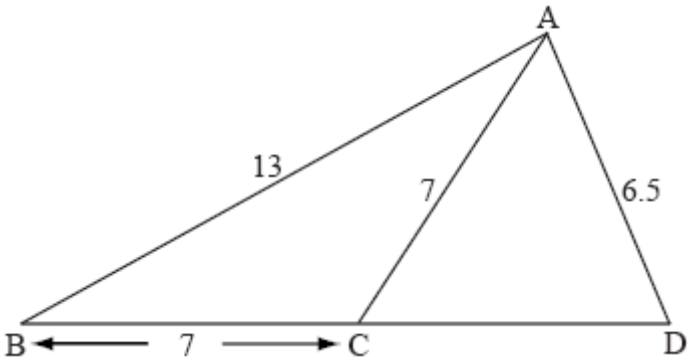


diagram not to scale

(a) Find the size of angle ACB.

(3)

(b) Find the size of angle CAD.

(5)
(Total 8 marks)

4. The diagram below shows triangle PQR. The length of [PQ] is 7 cm, the length of [PR] is 10 cm, and $P\hat{Q}R$ is 75°.

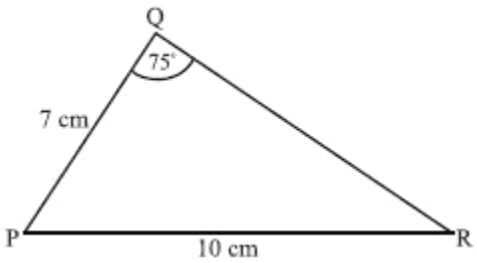


diagram not to scale

(a) Find angle QPR.

(3)

(b) Find the area of triangle PQR.

(3)
(Total 6 marks)

5. In the triangle PQR, PR = 5 cm, QR = 4 cm and PQ = 6 cm.

Calculate

(a) the size of $P\hat{Q}R$;

(b) the area of triangle PQR.

(Total 6 marks)

6. A triangle has sides of length 4, 5, 7 units. Find, to the nearest tenth of a degree, the size of the largest angle.

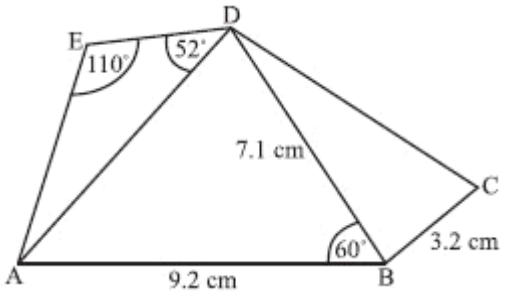
(Total 4 marks)

7. In a triangle ABC, BC = 4 cm, AC = 3 cm and $B = 40°$.

Find all possible values of the angle A.

(Total 6 marks)

8. The following diagram shows a pentagon ABCDE, with AB = 9.2 cm, BC = 3.2 cm, BD = 7.1 cm, $A\hat{E}D = 110°$, $A\hat{D}E = 52°$ and $A\hat{B}D = 60°$.



(a) Find AD.

(4)

(b) Find DE.

(4)

(c) The area of triangle BCD is 5.68 cm^2. Find $D\hat{B}C$.

(4)

(d) Find AC.

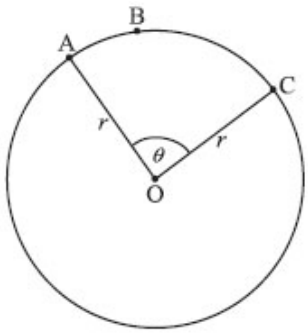
(4)

(e) Find the area of quadrilateral ABCD.

(5)

(Total 21 marks)

9. The following diagram shows a circle with radius *r* and centre O. The points A, B and C are on the circle and $A\hat{O}C = \theta$.

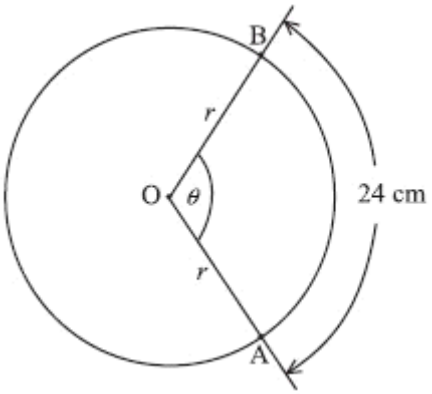


The area of sector OABC is $\frac{4}{3}\pi$ and the length of arc ABC is $\frac{2}{3}\pi$.

Find the value of *r* and of θ.

(Total 6 marks)

10. The diagram below shows a circle of radius r and centre O. The angle $A\hat{O}B = \theta$.

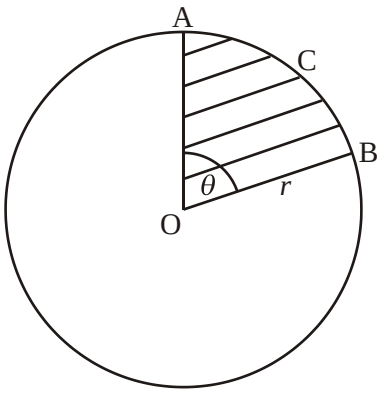


The length of the arc AB is 24 cm. The area of the sector OAB is 180 cm^2.

Find the value of r and of θ.

(Total 6 marks)

11. The following diagram shows a circle of centre O, and radius r. The shaded sector OACB has an area of 27 cm^2. Angle $A\hat{O}B = \theta = 1.5$ radians.

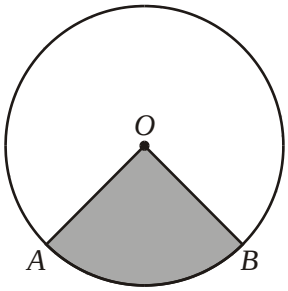


(a) Find the radius.

(b) Calculate the length of the minor arc ACB.

(Total 6 marks)

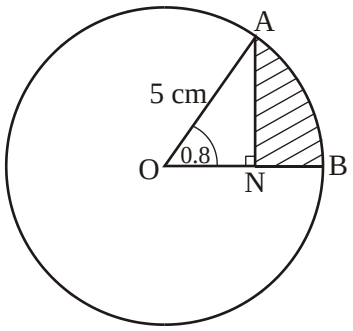
12. O is the centre of the circle which has a radius of 5.4 cm.



The area of the shaded sector OAB is 21.6 cm^2. Find the length of the minor arc AB.

(Total 4 marks)

13. The diagram below shows a circle of radius 5 cm with centre O. Points A and B are on the circle, and $A\hat{O}B$ is 0.8 radians. The point N is on [OB] such that [AN] is perpendicular to [OB].



Find the area of the shaded region.

(Total 6 marks)

14. The following diagram shows a circle of centre O, and radius 15 cm. The arc ACB subtends an angle of 2 radians at the centre O.

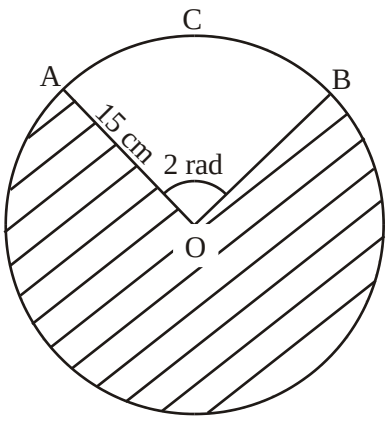


Diagram not to scale

$A\hat{O}B = 2$ radians
OA = 15 cm

Find

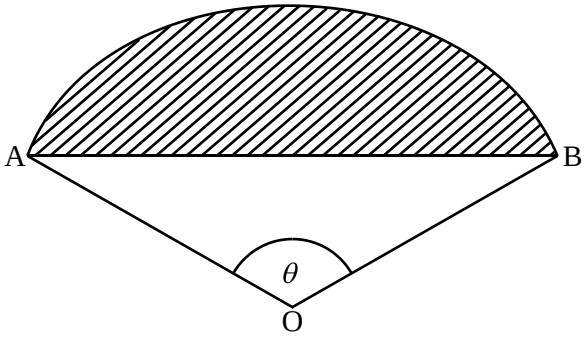
(a) the length of the arc ACB;

(b) the area of the shaded region.

(Total 6 marks)

15. The diagram below shows a sector AOB of a circle of radius 15 cm and centre O. The angle θ at the centre of the circle is 2 radians.

Diagram not to scale



(a) Calculate the area of the sector AOB.

(b) Calculate the area of the shaded region.

(Total 4 marks)

16. Consider the expansion of the expression $(x^3 - 3x)^6$.

(a) Write down the number of terms in this expansion.

(b) Find the term in x^{12}.

(c) Does this expansion contain a constant term? Use the general term of the binomial expansion to explain why or why not.

(Total 8 marks)

17. Consider the expansion of $(x^2 - 2)^5$.

(a) Write down the number of terms in this expansion.

(b) The first four terms of the expansion in descending powers of x are

$$x^{10} - 10x^8 + 40x^6 + Ax^4 + ...$$

Find the value of A.

(Total 6 marks)