Unit 2

Geometry and Measurement

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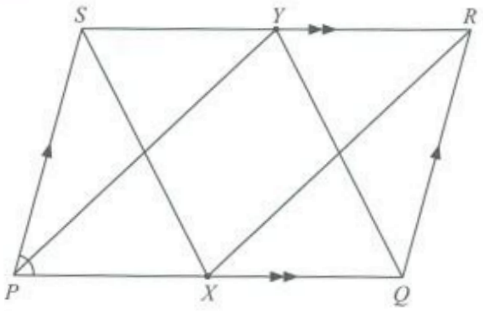
2.6 Properties of Circle

Answer **all** questions. Show your workings clearly in the space provided.

1. In the diagram, $PQRS$ is a parallelogram. X and Y lies on the midpoints of PQ and SR respectively and $\angle SPX = 75°$.



(a) Prove that $\triangle PSY$ is congruent to $\triangle RQX$. [3]

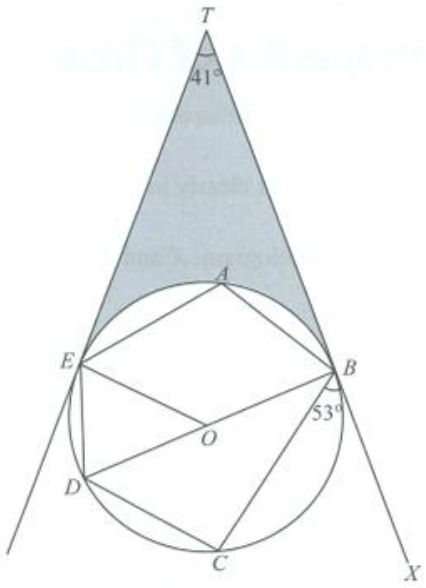
(b) A circle was drawn with PY as its diameter. Will S lie outside the circle, within the circle or on the circumference of the circle? Explain your answer.

Answer:

(b) _____

_____ [2]

2. In the diagram, the points A, B, C, D and E lie on the circumference of a circle with centre O. TE and TBX are tangents to the circle, $\angle ETB = 41°$ and $\angle XBC = 53°$.



(a) Showing your working clearly, find
   (i) $\angle EOB$,
   (ii) $\angle EAB$,
   (iii) $\angle EDB$,
   (iv) $\angle BDC$.

(b) Given that the radius of the circle is 8 cm, find
   (i) the length of TE,
   (ii) the area of the shaded region.

Answer: (a)(i) _____ [2]

(ii) _____ [2]

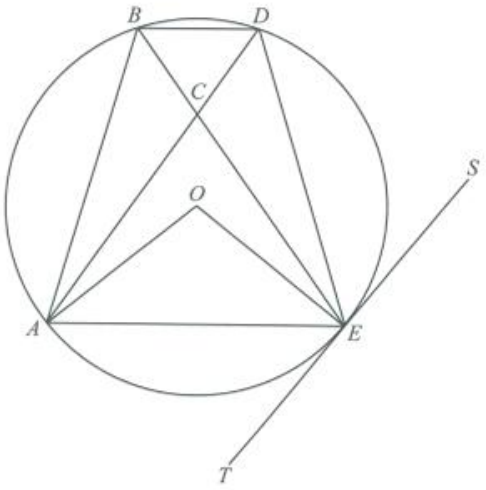
(iii) _____ [1]

(iv) _____ [2]

(b)(i) _____ [2]

(ii) _____ [3]

3. In the diagram, A, B, D and E lie on the circumference of a circle centred at O. C is a point that lies inside the circle such that $BC = DC$. The line TS is a tangent to the circle at E.



(a) Prove that $\triangle ABC$ is congruent to $\triangle EDC$. [4]

(b) Given that $\angle ABC = 51°$ and $\angle ACE = 72°$, find

(i) $\angle AOE$,

(ii) $\angle AET$,

(iii) $\angle CED$,

(iv) $\angle DBE$.

(c) Is BD parallel to AE? Explain your answer. [1]

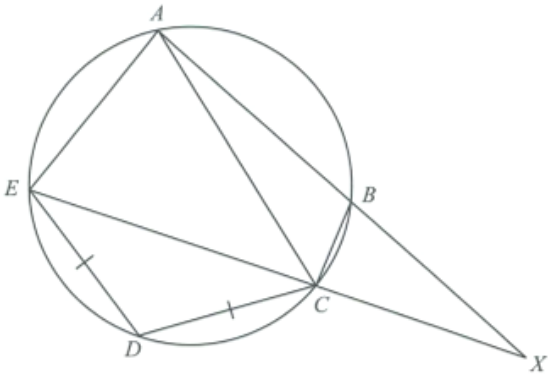
Answer: (b)(i) _____ [1]

(ii) _____ [2]

(iii) _____ [2]

(iv) _____ [2]

4. In the diagram, the points A, B, C, D and E lie on the circumference of a circle. X is a point that lie on AB and EC produced, and $ED = CD$.



(a) Show that $\triangle AXE$ is similar to $\triangle CXB$. [3]

(b) Given that $\angle ECD = y°$ and $\angle BCX = (3y + 5)°$, express $\angle BAC$ in terms of y.

Answer: (b) _____ [3]