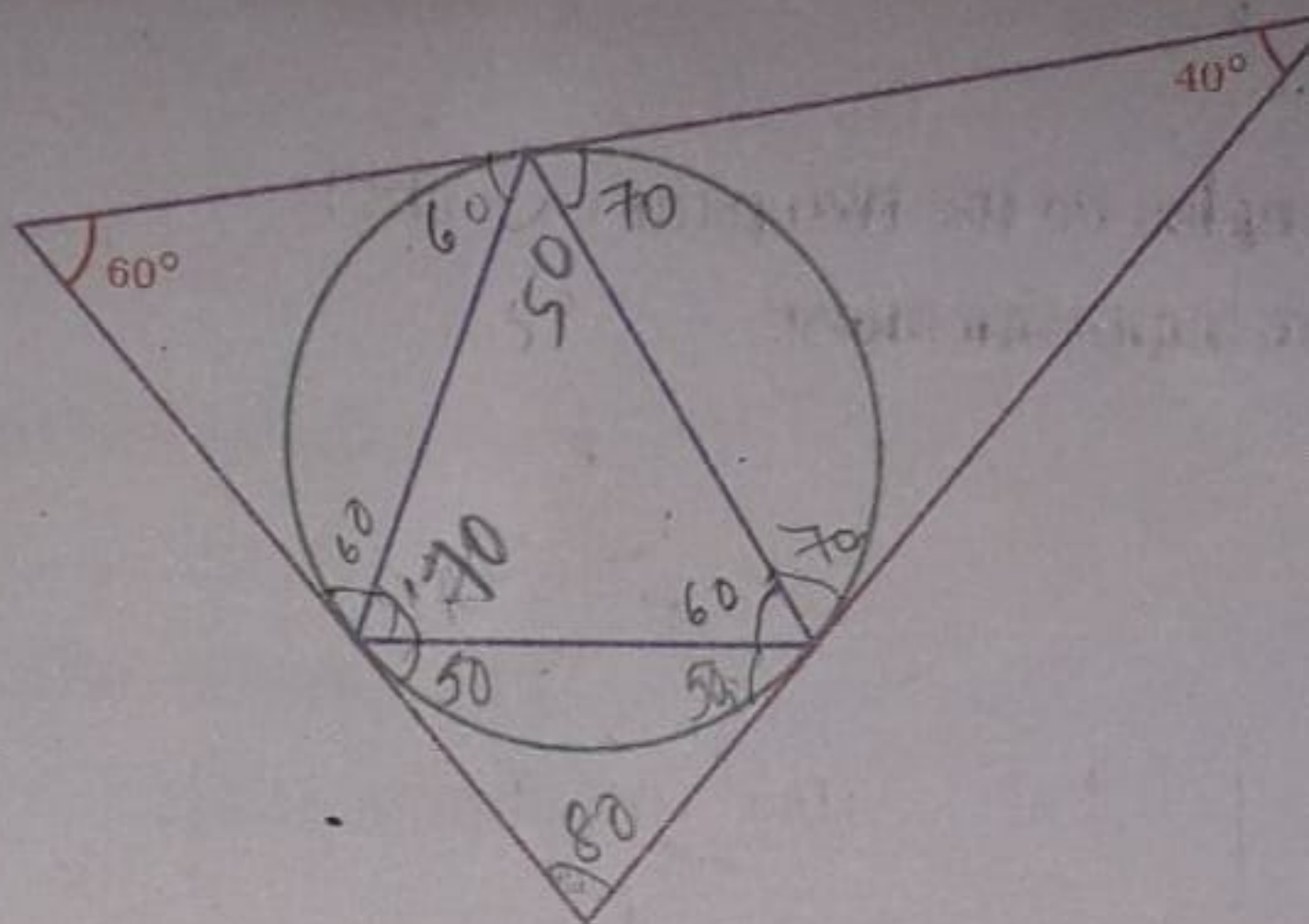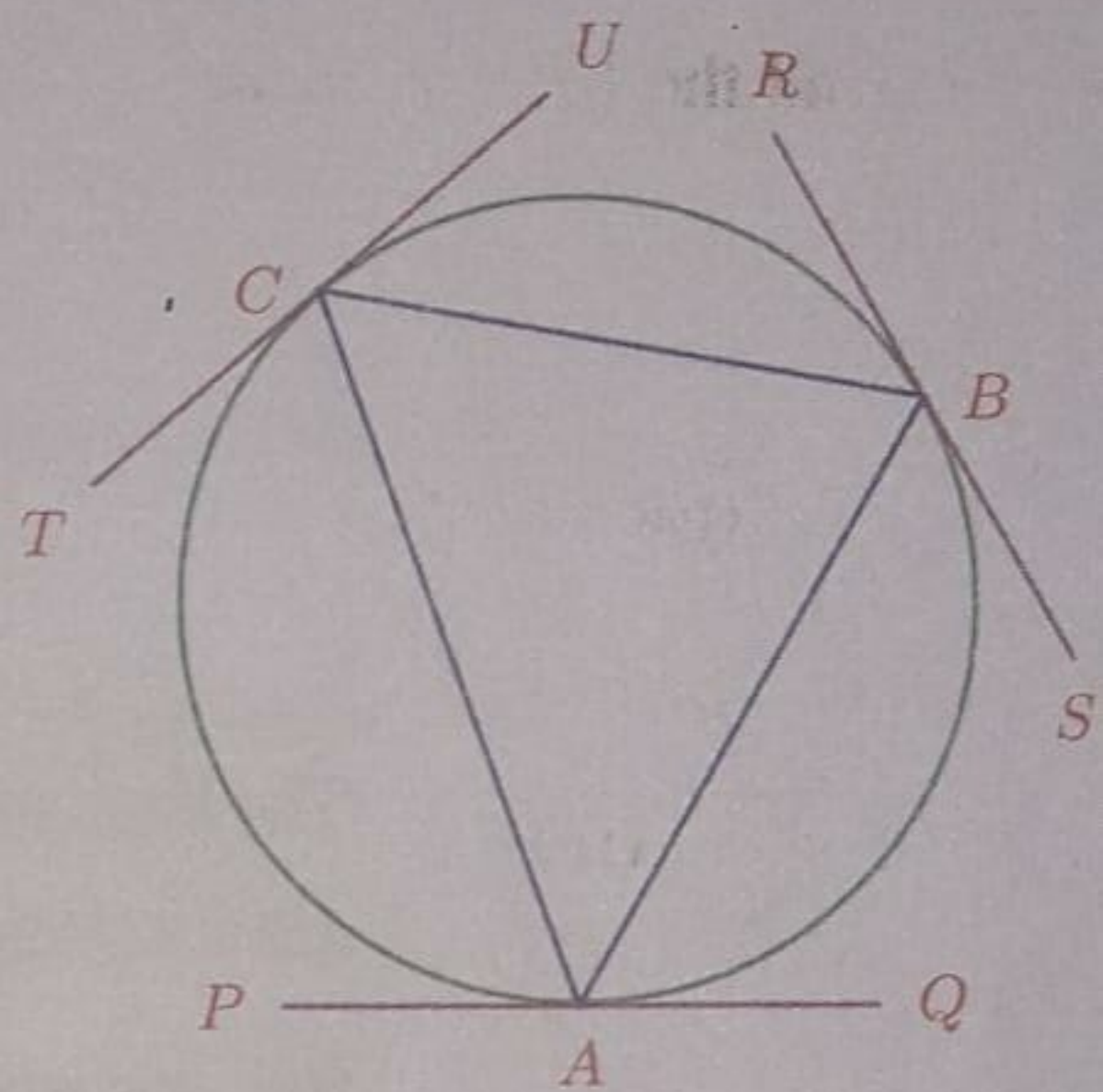(2) In the picture, the sides of the large triangle are tangents of the circumcircle of the smaller triangle, through its vertices.

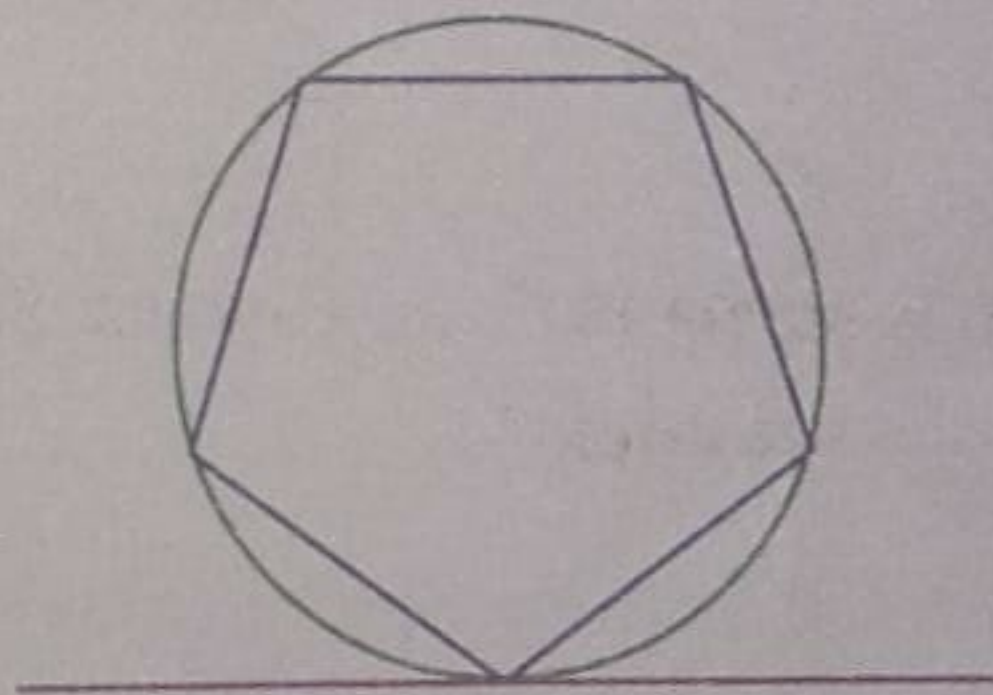Calculate the angles of the smaller triangle.

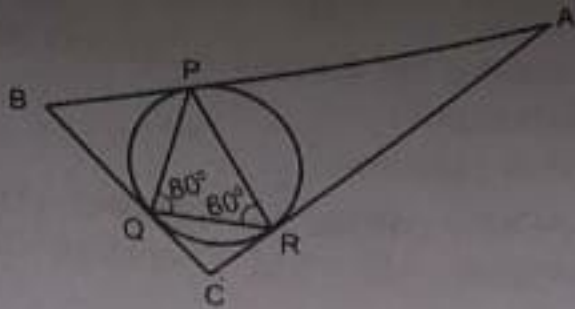(3) In the picture, PQ, RS, TU are tangents to the circumcircle of △ABC.

Sort out the equal angles in the picture.

(4) In the picture, the tangent to the circumcircle of a regular pentagon through a vertex is shown.

Calculate the angle which the tangent makes with the two sides of the pentagon through the point of contact.

$\angle APR = 80^\circ$

$AP = AR$

$\angle ARP = 80^\circ$

$\angle A = 180 - (80 + 80) = 180 - 160 = 20^\circ$

$\angle BPQ = 60^\circ$

$\angle BQP = 60^\circ$
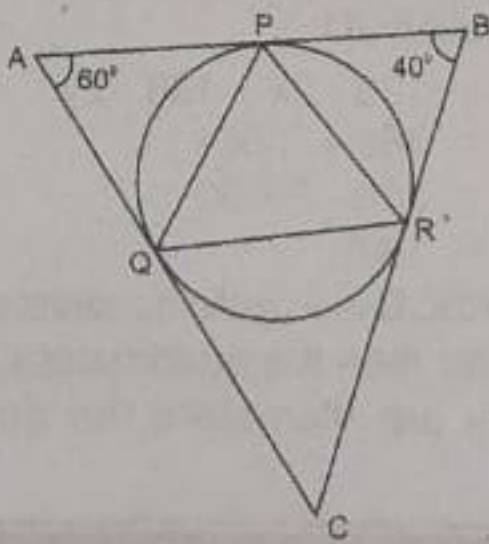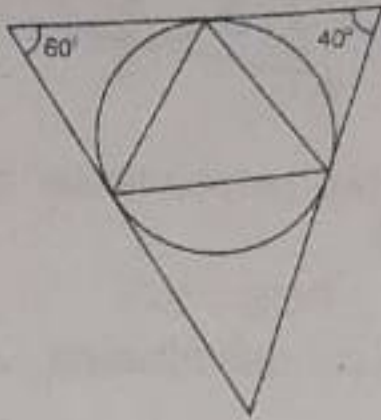
$\angle PBQ = 60^\circ \ \angle B = 60^\circ$

$\angle C = 180 - (60 + 20) = 100^\circ$

The angles of the bigger triangle are 60°, 100° and 20°.

Qn. 2

The sides of the bigger triangle in the figure are the tangents draw to the circum circle through the vertices of the smaller triangle. Find out the angles of the smaller triangle.

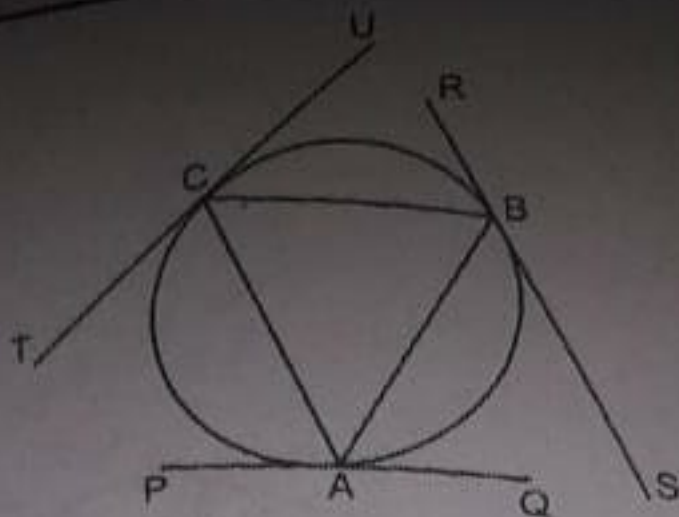$BP = BR, \angle BPR = \angle BRP = 70^\circ$

$\angle PQR = 70^\circ, AP = AQ$

Therefore $\angle APQ = \angle AQP = 60^\circ$

$\angle PRQ = 60^\circ \quad \angle PQR = 180 - (70 + 60)$

$\qquad\qquad\qquad\qquad = 180 - 130$

$\qquad\qquad\qquad\qquad = 50^\circ$

Qn. 3

The lines PQ, RS and Tu in the figure are the tangents drawn to the circum circle through the vertex of the triangle of ABC. Write equal angle from the figure.

Ans.
$$\angle TCA = \angle PAC = \angle CBA$$
$$\angle UCB = \angle RBC = \angle CAB$$
$$\angle SAB = \angle QAB = \angle ACB$$

Qn. 4

A tangents is drawn to the circumcircle in the figure through the vertex of the regular pentagon. Find the angle between the tangent and the sides of the pentagon through the contact point.

Ans.
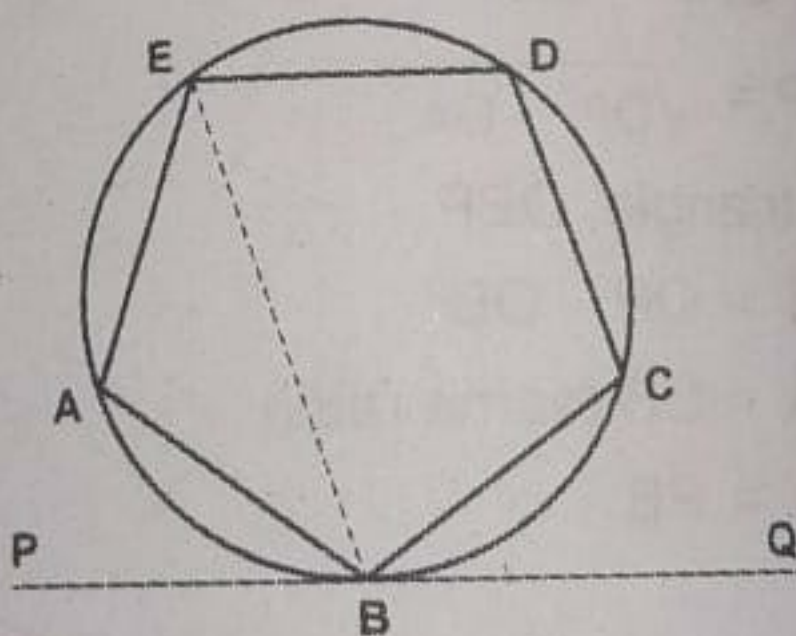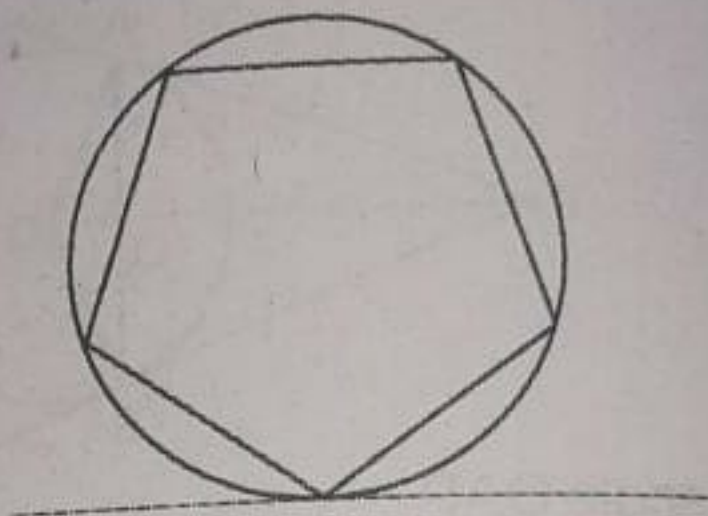
$$\angle EAB = \frac{540}{5} = 108^\circ$$

In $\triangle ABE$, $AB = AE$

$$\angle AEB = \angle ABE = 36^\circ$$
$$\angle ABP = 36^\circ$$
$$\angle CQB = 36^\circ$$