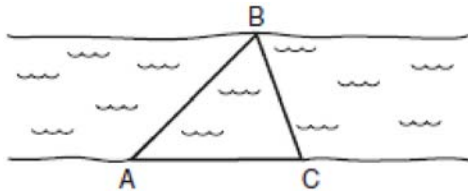


G.G.34: Angle Side Relationship: Determine either the longest side of a triangle given the three angle measures or the largest angle given the lengths of three sides of a triangle

- 1 On the banks of a river, surveyors marked locations A , B , and C . The measure of $\angle ACB = 70^\circ$ and the measure of $\angle ABC = 65^\circ$.



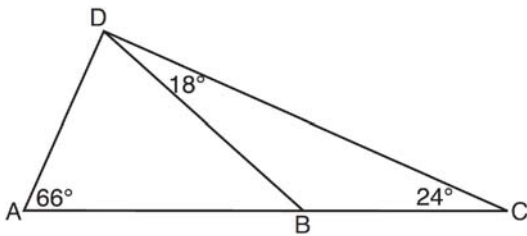
Which expression shows the relationship between the lengths of the sides of this triangle?

- 1) $AB < BC < AC$
 2) $BC < AB < AC$
 3) $BC < AC < AB$
 4) $AC < AB < BC$
- 2 In $\triangle ABC$, $m\angle A = 60$, $m\angle B = 80$, and $m\angle C = 40$. Which inequality is true?
 1) $AB > BC$
 2) $AC > BC$
 3) $AC < BA$
 4) $BC < BA$
- 3 In $\triangle ABC$, $m\angle A = 95$, $m\angle B = 50$, and $m\angle C = 35$. Which expression correctly relates the lengths of the sides of this triangle?
 1) $AB < BC < CA$
 2) $AB < AC < BC$
 3) $AC < BC < AB$
 4) $BC < AC < AB$
- 4 In $\triangle RST$, $m\angle R = 58$ and $m\angle S = 73$. Which inequality is true?
 1) $RT < TS < RS$
 2) $RS < RT < TS$
 3) $RT < RS < TS$
 4) $RS < TS < RT$
- 5 In scalene triangle ABC , $m\angle B = 45$ and $m\angle C = 55$. What is the order of the sides in length, from longest to shortest?
 1) $\overline{AB}, \overline{BC}, \overline{AC}$
 2) $\overline{BC}, \overline{AC}, \overline{AB}$
 3) $\overline{AC}, \overline{BC}, \overline{AB}$
 4) $\overline{BC}, \overline{AB}, \overline{AC}$
- 6 In $\triangle ABC$, $\angle A \cong \angle B$ and $\angle C$ is an obtuse angle. Which statement is true?
 1) $\overline{AC} \cong \overline{AB}$ and \overline{BC} is the longest side.
 2) $\overline{AC} \cong \overline{BC}$ and \overline{AB} is the longest side.
 3) $\overline{AC} \cong \overline{AB}$ and \overline{BC} is the shortest side.
 4) $\overline{AC} \cong \overline{BC}$ and \overline{AB} is the shortest side.
- 7 In $\triangle ABC$, $AB = 7$, $BC = 8$, and $AC = 9$. Which list has the angles of $\triangle ABC$ in order from smallest to largest?
 1) $\angle A, \angle B, \angle C$
 2) $\angle B, \angle A, \angle C$
 3) $\angle C, \angle B, \angle A$
 4) $\angle C, \angle A, \angle B$

- 8 In $\triangle PQR$, $PQ = 8$, $QR = 12$, and $RP = 13$. Which statement about the angles of $\triangle PQR$ must be true?
- 1) $m\angle Q > m\angle P > m\angle R$
 - 2) $m\angle Q > m\angle R > m\angle P$
 - 3) $m\angle R > m\angle P > m\angle Q$
 - 4) $m\angle P > m\angle R > m\angle Q$

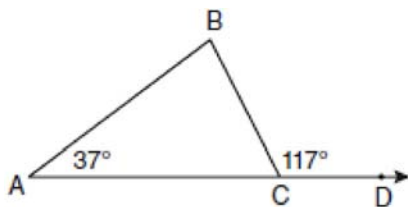
- 11 In $\triangle ABC$, $m\angle A = x^2 + 12$, $m\angle B = 11x + 5$, and $m\angle C = 13x - 17$. Determine the longest side of $\triangle ABC$.

- 9 As shown in the diagram of $\triangle ACD$ below, B is a point on \overline{AC} and DB is drawn.



If $m\angle A = 66$, $m\angle CDB = 18$, and $m\angle C = 24$, what is the longest side of $\triangle ABD$?

- 1) \overline{AB}
 - 2) \overline{DC}
 - 3) \overline{AD}
 - 4) \overline{BD}
- 10 In the diagram below of $\triangle ABC$ with side \overline{AC} extended through D , $m\angle A = 37$ and $m\angle BCD = 117$. Which side of $\triangle ABC$ is the longest side? Justify your answer.



(Not drawn to scale)

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Answer Section

- 1 ANS: 3 REF: 060629a
 2 ANS: 2 REF: 061321ge
 3 ANS: 2 REF: 060911ge
 4 ANS: 4 REF: 011222ge
 5 ANS: 4
 $m\angle A = 80$

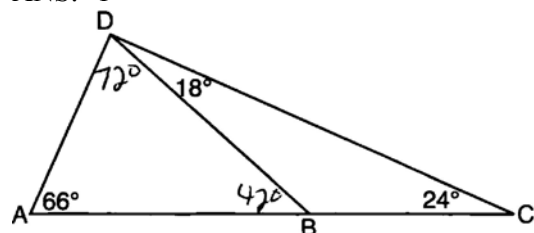
REF: 011115ge

- 6 ANS: 2 REF: 081306ge
 7 ANS: 4

Longest side of a triangle is opposite the largest angle. Shortest side is opposite the smallest angle.

REF: 081011ge

- 8 ANS: 1 REF: 061010ge
 9 ANS: 1



REF: 081219ge

- 10 ANS:
 \overline{AC}

REF: 080934ge

- 11 ANS:

$x^2 + 12 + 11x + 5 + 13x - 17 = 180$. $m\angle A = 6^2 + 12 = 48$. $\angle B$ is the largest angle, so \overline{AC} is the longest side.

$$x^2 + 24x - 180 = 0 \quad m\angle B = 11(6) + 5 = 71$$

$$(x + 30)(x - 6) = 0 \quad m\angle C = 13(6) - 7 = 61$$

$$x = 6$$

REF: 011337ge