Exterior angle property of triangle

A. Choose the correct answer:

1. The exterior angle of a triangle is equal to the

a) product of two interior angles
b) sum of all three angles
c) sum of two opposite interior angles
d) difference of two interior angles

2. If an exterior angle is 120° and one of the opposite interior angles is 50°, the other opposite interior angle is

a) 60°
b) 70°
c) 50°
d) 80°

3. The sum of the two remote interior angles of a triangle is always equal to

a) 360°
b) 90°
c) the adjacent interior angle
d) the exterior angle

4. If one exterior angle of a triangle is 100° and one of the opposite interior angles is 30°, the third angle is

a) 70°
b) 80°
c) 60°
d) 90°

5. The number of exterior angles a triangle can have, one at each vertex, is

a) 2
b) 3
c) 4
d) 5

B. Write the Missing Terms to Complete the Sentences:

1. An exterior angle of a triangle is equal to the sum of the _____ interior opposite angles.
2. The exterior angle is formed by extending one side of the _____.
3. If the exterior angle is 130° and one interior opposite angle is 60°, the other is _____.
4. The interior and exterior angle at a vertex are always _____.
5. The measure of an exterior angle plus its adjacent interior angle is always _____.

C. Mark each sentence with a True (✔) or False (✗):

1. The exterior angle of a triangle is always less than 180°. _____
2. The sum of the interior and exterior angles at a vertex is 90°. _____
3. The exterior angle is equal to the adjacent interior angle. _____
4. Each triangle has only one exterior angle. _____
5. An exterior angle equals the sum of two opposite interior angles. _____

D. Figure out the answers to these questions:

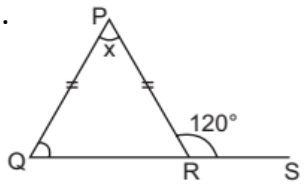
1. The exterior angle at vertex A of triangle ABC is 110°, and the opposite interior angle at C is 45°. Find angle B.
2. Prove that the exterior angle of a triangle is equal to the sum of its two opposite interior angles.
3. One angle of a triangle is 40°, and the exterior angle at the adjacent vertex is 110°. Find the remaining two angles.
4. In triangle XYZ, the exterior angle at vertex Y is 135°, and one of the opposite interior angles is 65°. Find the third angle.
5. Draw a triangle and show an exterior angle. Label the remote interior angles and verify the property with measurements.

E. Challenge yourself with these questions:

1. If an exterior angle of a triangle is 105° and one of its remote interior angles is 55°, find the third angle of the triangle.
2. In triangle PQR, the exterior angle at vertex R is 120°, and angle P is 70°. Find angle Q.
3. The exterior angle at vertex B of triangle ABC is formed by extending side AC. If angle A = 40° and angle C = 60°, find the exterior angle.
4. A triangle has angles x, y, and z. Find the exterior angle at the vertex where the angle is z in terms of x and y.
5. Measure and verify the exterior angle property using a protractor on a drawn triangle.

F. Find angles x and y in each figure:

a.



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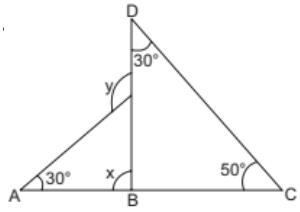

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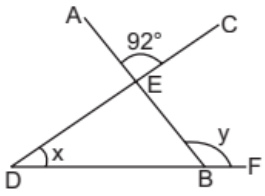

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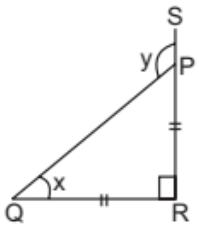

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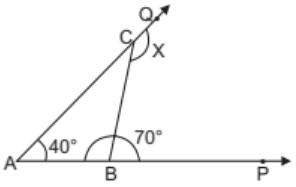

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