

Geometry - Theorems About Triangles - Test

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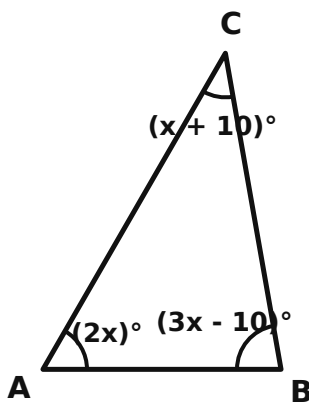
Name: _____ Class: _____ Date: ____/____/____

This 45-minute test checks triangle angle theorems, midsegments, centroids and the triangle inequality. It has 9 questions worth 20 points in total. Show every step of the work, label diagrams, and include units where they apply. Calculators are allowed unless the teacher says otherwise.

About this test

- Grade: Geometry
- Chapter: Theorems About Triangles
- Standards: G-CO.C.10
- Time: 45 minutes
- Total: 20 points

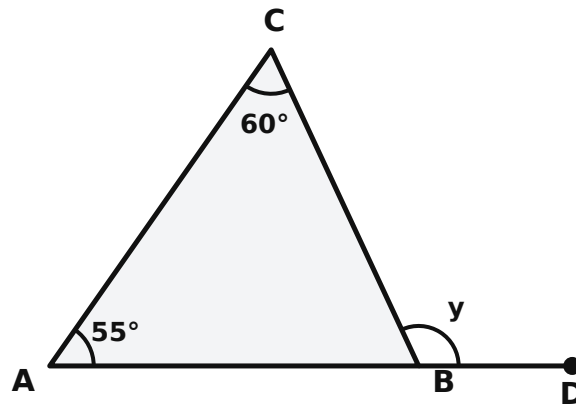
Question 1 - Angle sum [2 pts]



Triangle ABC.

Find x and the measure of each angle.

Question 2 - Exterior angle [2 pts]



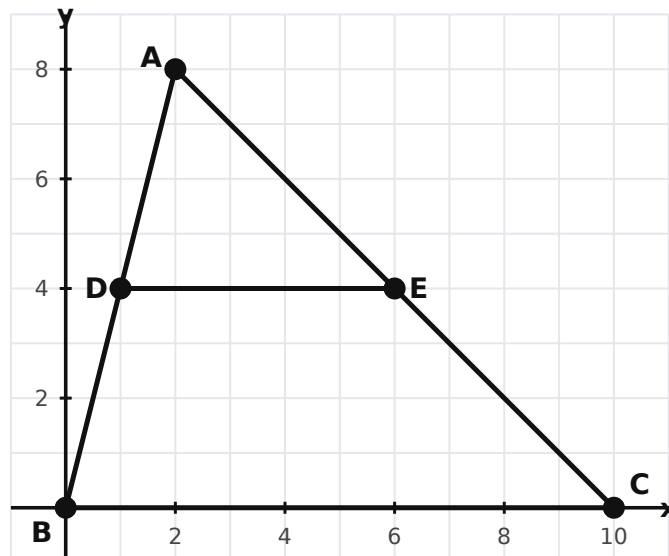
Exterior angle at B.

Find y , the exterior angle at B.

Question 3 - Apex angle [2 pts]

The apex angle of an isosceles triangle is $(6x+4)^\circ$ and each base angle is $(2x+8)^\circ$. Determine x and the apex angle.

Question 4 - Midsegment [3 pts]



D and E are midpoints of AB and AC.

- Find the coordinates of D, the midpoint of AB, and E, the midpoint of AC. (1 point)
- Find DE and BC. (1 point)

c. Describe how DE and BC are related. (1 point)

Question 5 - Centroid [2 pts]

A triangle has vertices (1, 2), (7, 2) and (4, 11). Find its centroid. A median from one vertex is 12 units long; how far is the centroid from that vertex?

Question 6 - Triangle inequality [3 pts]

- a. Can sides 8, 9 and 17 form a triangle? Explain. (1 point)
- b. Two sides measure 6 and 15. Find the range of the third side. (1 point)
- c. Find the greatest whole-number perimeter of such a triangle. (1 point)

Question 7 - Why 180 [2 pts]

A line through vertex A of triangle ABC is parallel to BC. Explain why this shows that the angles of the triangle add to 180° .

Question 8 - Ramp angles [2 pts]

A triangular ramp support has angles in the ratio 3 : 4 : 5. Find all three angles, and decide whether it is a right triangle.

Question 9 - Equilateral side [2 pts]

An equilateral triangle has sides $4x+2$, $6x-8$ and $3x+7$. Find x , the side length and the measure of each angle.