

Watch. Practice. Understand. | Lesson 077

7 1 Polygons 2nd Half Diagonal, N, Midsegment of a Triangle Proof

Watch the matching video: <https://www.youtube.com/watch?v=z0QnINTL6ok>

Practice focus: Triangle midsegments and centers

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 A triangle midsegment is parallel to a side of length 18. Find the midsegment length.

02 A median is 15 units long. Find the vertex-to-centroid distance.

03 What point is equidistant from all three vertices of a triangle?

04 Two triangle sides are 6 and 10. State the possible lengths x of the third side.

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Practice focus: Triangles, congruence and inequality

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05 A triangle has angles x , $2x$ and $3x$ degrees. Find and classify its angles.

06 Can sides of lengths 4, 7 and 12 form a triangle?

07 Two triangles have matching sides 5 and 8 and the included angle 40° . Are they congruent?

08 In congruent triangles ABC and DEF (in that order), $AB = 7$ and angle $C = 50^\circ$. Find DE and angle F.

Worked answers | Lesson 077

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01 A triangle midsegment is parallel to a side of length 18. Find the midsegment length.

A midsegment is half the parallel side: 9.

02 A median is 15 units long. Find the vertex-to-centroid distance.

The centroid divides a median 2:1 from the vertex: $(\frac{2}{3})(15) = 10$.

03 What point is equidistant from all three vertices of a triangle?

The circumcenter, the intersection of the perpendicular bisectors.

04 Two triangle sides are 6 and 10. State the possible lengths x of the third side.

Triangle inequality gives $|10 - 6| < x < 10 + 6$, so $4 < x < 16$.

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05 A triangle has angles x , $2x$ and $3x$ degrees. Find and classify its angles.

$6x = 180$, so angles are 30° , 60° , 90° . It is a right triangle.

06 Can sides of lengths 4, 7 and 12 form a triangle?

No: $4 + 7 = 11 < 12$ violates the triangle inequality.

07 Two triangles have matching sides 5 and 8 and the included angle 40° . Are they congruent?

Yes, by SAS. The equal angle must be included between the matched sides.

08 In congruent triangles ABC and DEF (in that order), $AB = 7$ and angle $C = 50^\circ$. Find DE and angle F.

Corresponding parts of congruent triangles are congruent: $DE = 7$ and angle $F = 50^\circ$.