

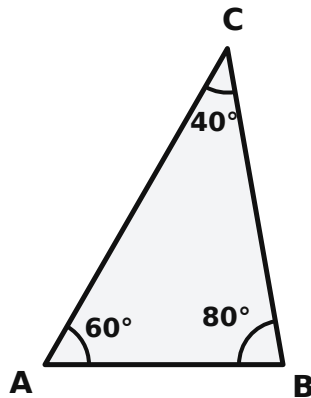
Geometry - Theorems About Triangles - Test Answer Key

Common Core G-CO.C.10 · maths-pdf.fr/en/

Use this answer key and scoring guide for the triangle theorems test. Each solution shows the full work, and the scoring note tells how the points are split between method and final answer. Partial credit is listed so that grading stays consistent from one paper to the next.

Geometry · Common Core State Standards: **G-CO.C.10**

Question 1 - Angle sum [2 pts]



Angles 60°, 80°, 40°.

$$2x + (3x - 10) + (x + 10) = 180$$

$$6x = 180$$

$$x = 30$$

Angles: 60°, 80°, 40°.

x = 30; 60°, 80°, 40°

Scoring: 1 point for the equation, 1 point for x and the angles.

Question 2 - Exterior angle [2 pts]

Remote interior angles: 55° and 60°.

$$y = 55^\circ + 60^\circ = 115^\circ$$

115°

Scoring: 1 point for using the theorem, 1 point for the value.

Question 3 - Apex angle [2 pts]

The three angles add to 180°: $(6x+4)+2(2x+8)=180$.

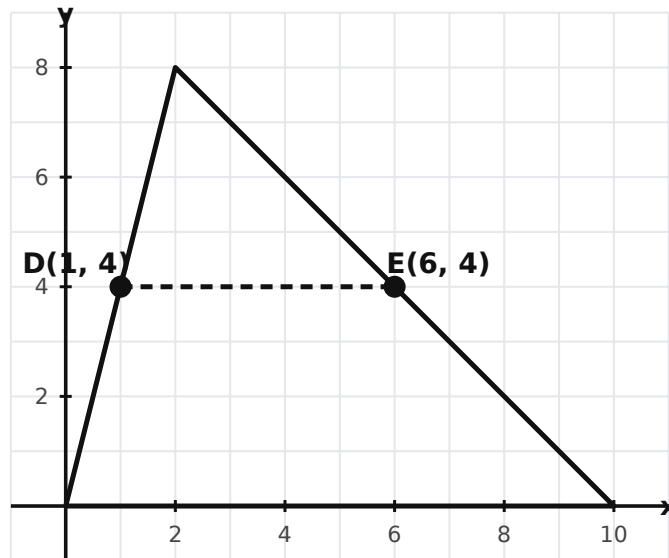
$10x+20=180$, so $x=16$.

Apex angle: $6(16)+4=100^\circ$ (base angles 40°).

$x = 16$; apex angle 100°

Scoring: 1 point for the equation, 1 point for x and the apex angle.

Question 4 - Midsegment [3 pts]



$DE = 5$ is half of $BC = 10$.

- a. $D(1,4)$ and $E(6,4)$
- b. $DE=5$ and $BC=10$
- c. DE is parallel to BC (both horizontal) and half as long.

Scoring: 1 point per part.

Question 5 - Centroid [2 pts]

$$\left(\frac{1+7+4}{3}, \frac{2+2+11}{3}\right) = (4, 5).$$

The centroid is two thirds along the median: $\frac{2}{3} \cdot 12 = 8$.

(4, 5); 8 units

Scoring: 1 point for the centroid, 1 point for the distance.

Question 6 - Triangle inequality [3 pts]

- a. $8+9=17$ is not greater than 17, so no.
- b. $15-6=9 < x < 21=15+6$
- c. The third side can be at most 20: $6+15+20=41$.

(a) No; (b) $9 < x < 21$; (c) 41

Scoring: 1 point per part.

Question 7 - Why 180 [2 pts]

The parallel line creates alternate interior angles at B and C that are congruent to angles B and C of the triangle.

Those two angles and angle A fill a straight line at A, which measures 180° .

Scoring: 1 point for alternate interior angles, 1 point for the straight line.

Question 8 - Ramp angles [2 pts]

Total parts: 12, so one part is $180^\circ \div 12 = 15^\circ$.

Angles: 45° , 60° , 75° . No angle is 90° , so it is not a right triangle.

45° , 60° , 75° ; not right

Scoring: 1 point for the angles, 1 point for the conclusion.

Question 9 - Equilateral side [2 pts]
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All sides are equal: $4x+2=6x-8$, so $x=5$.

Check: $3(5)+7=22$, and $4(5)+2=22$. Each side is 22 and each angle is 60° .

$x = 5$; side 22; angles 60°

Scoring: 1 point for x and the side, 1 point for the angles.

Total
20 points