

Grade 7 • Unit 7 Worksheet

Angles, Triangles, and Prisms

Name: _____

Date: _____

Part A • Warm-up: Angle Relationships

1. Define each in your own words.

a. Complementary angles:

b. Supplementary angles:

c. Vertical angles:

Part B • Finding Unknown Angles

2. Two angles are supplementary. One measures 53° . The other measures _____ $^\circ$.

3. An angle and its complement together form a right angle. One angle is 27° . The complement is _____ $^\circ$.

4. Two lines cross. One of the four angles measures 65° . Find the other three.

The vertical angle to 65° is _____ $^\circ$.

The two adjacent angles each measure _____ $^\circ$.

Justify your reasoning (one sentence each).

5. Three angles meet on a straight line: their measures are 40° , x° , and 65° .

Write an equation: $40 + x + 65 = \underline{\hspace{2cm}}$

Solve for x . $x = \underline{\hspace{2cm}}^\circ$

Part C • Triangle Conditions

6. For each set of side lengths, decide if a triangle can be formed. (Triangle inequality: each side must be less than the sum of the other two.)

- a. 3, 4, 5 ☐ Triangle? ☐ Yes ☐ No
- b. 2, 3, 7 ☐ Triangle? ☐ Yes ☐ No
- c. 6, 8, 10 ☐ Triangle? ☐ Yes ☐ No
- d. 5, 5, 11 ☐ Triangle? ☐ Yes ☐ No

State the triangle inequality in your own words:

7. Sketch a triangle with the given conditions. State whether a UNIQUE triangle is determined, MORE than one is possible, or NONE is possible.

- a. Three angles: 50° , 60° , 70° . ☐ Unique ☐ Many ☐ None. Explanation:
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- b. Three sides: 4, 5, 6. ☐ Unique ☐ Many ☐ None. Explanation:
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- c. Two angles 90° and 100° , one side 5. ☐ Unique ☐ Many ☐ None. Explanation:
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Part D • Cross-Sections

8. Describe the cross-section.

- a. A vertical slice through a cube (parallel to a face). Cross-section shape: _____
- b. A horizontal slice through a square pyramid. Cross-section shape: _____
- c. A vertical slice through a square pyramid through the apex. Cross-section shape: _____
- d. A horizontal slice through a cylinder. Cross-section shape: _____

Part E • Volume & Surface Area of Prisms

9. A right triangular prism has a triangular base with legs 3 cm and 4 cm (right triangle), and the prism height is 10 cm.

- a. Area of the triangular base: _____ sq cm
- b. Volume of the prism: _____ cubic cm

c. The triangle's hypotenuse is 5 cm. Calculate the surface area (2 triangle faces + 3 rectangular faces).

Surface area = _____ sq cm

Part F • Error Analysis & Reasoning

10. Lin and Diego argue: • Lin says: "Two angles that add to 180° must be supplementary AND adjacent (sharing a side)." • Diego says: "They must add to 180° but don't have to be adjacent."

Who is correct? Look up the definition you wrote in #1.

Give an example of two angles that sum to 180° but are NOT adjacent.
