Accelerated 6 · Unit 1 Worksheet

Areas

Name: _____ Date: _____

Part A · Quick Computations

Mental math. If you must show work, write it small in the margin.

½ · 12 · 8 _____	**6 · 4.5** _____	**8^2 (square)** _____	**2 · (5+3)** _____

Part B · Strategies for Finding Area

1. A parallelogram has base 9 cm and height 6 cm. ANOTHER parallelogram has base 12 cm and height 4.5 cm. Without doing both calculations, predict whether their areas are equal, and then verify.

Prediction (and reasoning):

Verification:

What do you notice about the relationship between their dimensions?

2. Find the area of THIS triangle in TWO genuinely different ways: a right triangle with legs 6 and 8 and hypotenuse 10. (Hint: which side is the base affects which is the height.)

Way 1. (use legs as base and height)

Way 2. (use hypotenuse as base — what is the height?)

If the two methods MUST give the same answer, what does that tell you about the height to the hypotenuse? Compute it.

Part C · Building Up From Pieces

3. A trapezoid has parallel sides of 5 cm and 11 cm, and height 4 cm. Find its area by decomposing it into a rectangle and two triangles. Then verify using the formula $\frac{1}{2} \cdot (b_1+b_2) \cdot h$.

Sketch and decomposition work:

Formula calculation:

Do your two answers match? If not, find the error.

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4. Han claims: "Any polygon can be decomposed into triangles." Diego claims: "And the number of triangles is always two less than the number of sides." Test both claims on a pentagon and a hexagon by sketching.

Pentagon: number of triangles = _____

Hexagon: number of triangles = _____

Is Diego right? Try one more shape (heptagon or octagon) to see.

Part D · Surface Area

5. A rectangular prism has dimensions 3 cm × 4 cm × 5 cm.

a. Find its surface area.

b. Sketch a net (any valid arrangement).

c. If you doubled every edge length, would the surface area double? Predict, then check.

6. A triangular prism has two triangular faces (each: base 6, height 4, hypotenuse 7.2) and three rectangular faces. The prism is 10 cm long. Find its surface area.

Total triangle area: _____ cm²

Three rectangle areas: _____ + _____ + _____ = _____ cm²

Total surface area: _____ cm²

Part E · Thinking Deeply

7. Two students argue. Lin says: "If two parallelograms have the same base and the same height, they have the same area, even if they look totally different." Diego says: "That can't be right — a really slanted one has less stuff inside it." Who is correct, and why? Use a sketch in your explanation.

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8. A net is made of 6 squares arranged in a row. Can it fold into a cube? Why or why not?

Answer: ☐ Yes ☐ No

Justify with reasoning about adjacent faces:

Sketch ONE arrangement of 6 squares that DOES fold into a cube, and ONE that doesn't.

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9. A composite shape: imagine a 10×10 square with a triangle (base 10, height 4) sitting on top (like a house). NOW imagine the same square with the same triangle CUT OUT of one corner. Without computing, which has greater area, and by how much?

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10. Design challenge: Sketch a polygon with area EXACTLY 24 square units that is NOT a rectangle and NOT a triangle. Label all dimensions and prove the area is 24.