Lesson 5-8 · Session 1

Surface Area of Pyramids

Name _____ Date _____ Period _____

Maryland Standard 6.GR.4 · Learning target — I can find the surface area of a pyramid by adding the base area and the areas of its triangular faces.

Show a model, calculation, or explanation. Answer every part and label units when needed.

Exercises 1–12 earn 1 point for a correct response and 1 for supporting work. Spiral Review and Test Practice earn 1 point each.

Learn from a model

REMEMBER

- A pyramid's surface area = the area of its base + the area of all its triangular lateral faces.
- Each triangular face uses the slant height (not the pyramid's vertical height) to find its area.
- Watch out — the slant height runs along a triangular face; the vertical height runs inside the pyramid.
- Check it — a square pyramid always contributes one square and four triangles.

WORKED EXAMPLE

Surface Area of a Square Pyramid A square pyramid has a base 10 cm on each side. Each triangular face has a slant height of 12 cm. Find the surface area.

Step 1 The net is a square base with 4 congruent triangles, one on each side.

Step 2 Area of the square base. $10 \times 10 = 100$

Step 3 One triangular face uses the slant height. $\frac{1}{2} \times 10 \times 12 = 60$

Step 4 Four faces plus the base. $60 \times 4 = 240$, then $240 + 100 = 340$

Answer The surface area is 340 square centimeters (340 cm²).

Practice

1. A square pyramid has a base area of 16 sq ft and 4 triangular faces, each with area 10 sq ft. Find the total surface area.

Answer _____

SHOW YOUR THINKING

2. One triangular face of a pyramid has a base of 6 cm and a slant height of 8 cm. Find its area.

Answer _____

SHOW YOUR THINKING

3. Explain the difference between a pyramid's height and its slant height.

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

4. A square pyramid has a base 12 in. on each side and a slant height of 10 in.

a. area of the square base _____ in²
b. area of ONE triangular face _____ in²
c. all four triangular faces _____ in²
d. surface area of the pyramid _____ in²

Answer _____

SHOW YOUR THINKING

5. Tent Top. A tent top is a square pyramid with a base 14 ft on each side and a slant height of 12 ft. Find its total surface area, including the square base.

Answer _____

SHOW YOUR THINKING

6. Paperweight. A paperweight is a square pyramid with a base 6 cm on each side and a slant height of 9 cm. Find its total surface area, including the square base.

Answer _____

SHOW YOUR THINKING

7. Monument Model. A model is a square pyramid with a base 20 in. on each side and a slant height of 16 in. Every face is covered, base included. Find the surface area.

Answer _____

SHOW YOUR THINKING

8. A square pyramid has a base 16 m on each side and a slant height of 15 m. Selena wrote 'SA = 256 + 120 = 376 m².' Explain her mistake, then give the correct surface area.

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

9. A square pyramid has a base 12 cm on a side and a slant height of 8 cm. Find the surface area.

Answer _____ cm²

SHOW YOUR THINKING

10. A square pyramid has a base 5 in. on a side and a slant height of 6 in. Find the surface area.

Answer _____ in²

SHOW YOUR THINKING

11. Two Parts. A square pyramid has a base 9 m on a side and a slant height of 12 m. Find the base area and the triangle total.

Answer _____ base and triangles

SHOW YOUR THINKING

12. Find the Mistake. Nia used the vertical height of 9 m instead of the slant height of 15 m for the triangles. Explain the mistake.

Answer _____ the mistake

EXPLAIN WITH MATHEMATICAL EVIDENCE

Spiral review

13. From Lesson 5-7 Session 1. A prism 5 by 3 by 2 has what surface area?

Answer _____

SHOW YOUR THINKING

14. From Lesson 5-6 Session 2. A net of 2 pentagons and 5 rectangles makes what solid?

Answer _____

SHOW YOUR THINKING

15. From Lesson 4-1 Session 1. Write 22 out of 25 as a percent.

Answer _____

SHOW YOUR THINKING

Test practice

16. A base of 36 in² plus four triangles of 30 in² gives —

□ A. 156 in²	□ B. 66 in²
□ C. 120 in²	□ D. 1080 in²

17. A square pyramid's net has —

- □ A. 6 squares
- □ B. 1 square, 4 triangles
- □ C. 2 squares and 4 triangles
- □ D. 5 triangles

18. The triangles of a pyramid use the —

- □ A. base perimeter
- □ B. vertical height
- □ C. slant height
- □ D. volume

Check and revise

CHECK YOUR MATHEMATICS	HOW DID IT GO?
Use the height of each triangular face. Distinguish side-face area from total surface area. Every part answered / Work shown / Units labeled when needed	I can do this: Independently / With a hint / With help Question to revisit: _____

One correction or question I want to discuss: _____

Check each labeled measure and required face or region. Use square units for area and cubic units for volume.