11-2 Surface Areas of Prisms and Cylinders

Vocabulary

Review

Write T for *true* or F for *false*.

_____ **1.** A *lateral face* is a polygon surface of a solid.

_____ **2.** *Lateral faces* are surfaces of a polyhedron.

_____ **3.** A *lateral face* may be a circle.

_____ **4.** A base is a *lateral face*.

Vocabulary Builder

oblique (adjective) **oh** BLEEK

Definition: An **oblique** object is slanting, not straight.

Main Idea: **Oblique** means indirect and not straight to the point.

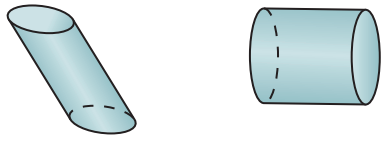
Other Word Forms: obliquely (adverb)

Math Usage: An **oblique** polyhedron has no vertical edge so an **oblique** prism is not a right prism.

Use Your Vocabulary

5. Circle the *oblique* prism.

6. Circle the *oblique* cylinder.



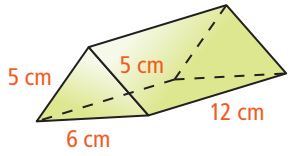
7. Complete with *oblique* or *obliquely*.

A right prism is not an _?_ prism.

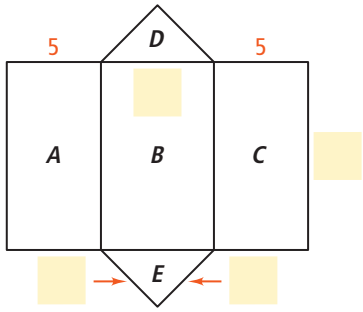
Your classmate answered the question _?_ .

Problem 1 Using a Net to Find Surface Area of a Prism

Got It? What is the surface area of the triangular prism? Use a net.



8. Label the missing dimensions in the net below.



9. The altitude a of each triangle forms a right triangle with legs of lengths a cm and ____ cm.

10. Use the Pythagorean Theorem to find a.

$$\square^2 + a^2 = 5^2$$
$$a^2 = 25 - \square$$
$$a^2 = \square$$
$$a = \square$$

11. Find the surface area of the prism.

S.A. = L.A. + area of base

= areas of two lateral rectangles + areas of two lateral triangles + area of base

= (Area A + Area C) + (Area D + Area E) + Area B

$= 5 \cdot \square + 5 \cdot \square + \frac{1}{2}(\square \cdot \square) + \frac{1}{2}(\square \cdot \square) + \square \cdot \square$

$= \square + \square + \square + \square + \square$

$= \square$

12. The surface area of the triangular prism is ____ cm^2.

take note

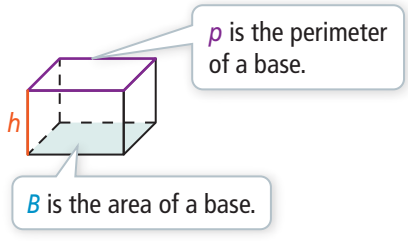
Theorem 11-1 Lateral and Surface Areas of a Prism

The lateral area of a right prism is the product of the perimeter of the base and the height of the prism.

L.A. = ph

The surface area of a right prism is the sum of the lateral area and the areas of the two bases.

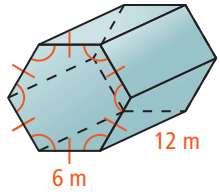
S.A. = L.A. + $2B$



13. Write the formula for S.A. using p and h.

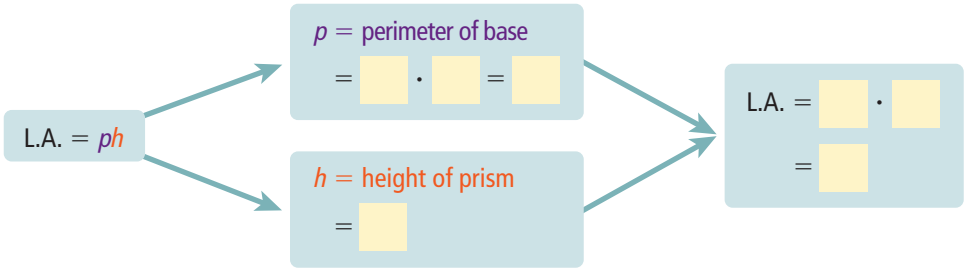
S.A. = ____ + $2B$

Problem 2 Using Formulas to Find Surface Area of a Prism



Got It? What is the lateral area of the prism at the right?

14. Complete the flow chart below.

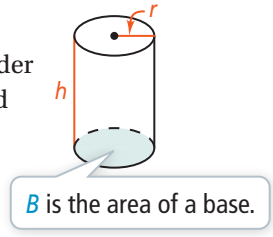


15. The lateral area of the prism is ____ m^2.

take note

Theorem 11–2 Lateral and Surface Areas of a Cylinder

16. Use the diagram at the right to complete the formulas below.



The lateral area of a right cylinder is the product of the circumference of the base and the height of the cylinder.

L.A. $= 2\pi r \cdot h$, or L.A. $= \pi \cdot$ ____ $\cdot h$

The surface area of a right cylinder is the sum of the lateral area and the areas of the two bases.

S.A. $=$ L.A. $+ 2B$

$=$ ____ $+ 2\pi r^2$

Problem 3 Finding Surface Area of a Cylinder

Got It? A cylinder has a height of 9 cm and a radius of 10 cm. What is the surface area of the cylinder in terms of π?

17. Use the information in the problem to complete the reasoning model below.

Think	Write
I can use the formula for the surface area of a cylinder.	S.A. $=$ L.A. $+ 2B$
Then I can substitute the formulas for lateral area and area of a circle.	$=$ ____ $+ 2 \cdot$ ____
Next I substitute 10 for the radius and 9 for the height.	$= 2\pi \cdot$ ____ $\cdot$ ____ $+ 2\pi \cdot$ ____^{2}
Now I simplify.	$=$ ____ $\cdot \pi +$ ____ $\cdot \pi$ $=$ ____ $\cdot \pi$

18. The surface area of the cylinder is ____ πcm^2.

Problem 4 Finding Lateral Area of a Cylinder

Got It? **A stencil roller has a height of 1.5 in. and a diameter of 2.5 in. What area does the roller cover in one turn? Round your answer to the nearest tenth.**

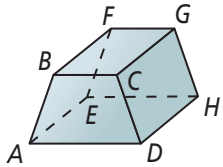
19. Underline the correct words to complete the sentence. The distance that is covered in one turn is the circumference / diameter of the circular base of the cylinder / prism.

20. Find the area the roller covers in one turn.

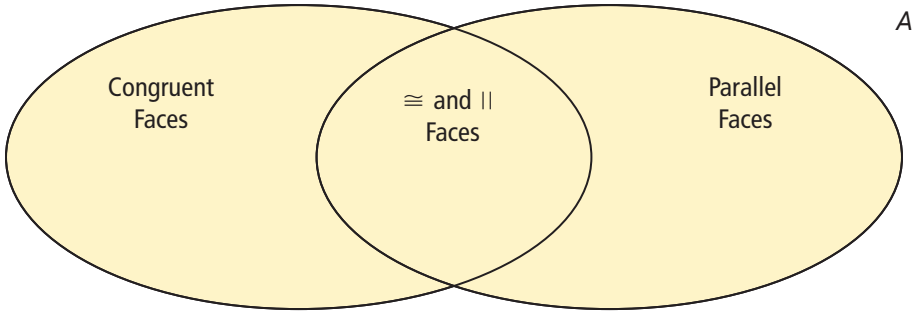
21. The roller covers about _____ $in.^2$ in one turn.

Lesson Check • Do you UNDERSTAND?

Vocabulary **Name the lateral faces and the bases of the prism at the right.**



22. Write the name of each of the _____ faces of the prism in the correct region of the Venn diagram.



23. Name the bases of the prism.

24. Name the lateral faces of the prism.

Math Success

Check off the vocabulary words that you understand.

☐ right prism ☐ oblique prism ☐ right cylinder ☐ oblique cylinder

Rate how well you can *find the surface area of a prism and a cylinder*.

Need to review 0 2 4 6 8 10 Now I get it!