Write your questions here!

6.1 GN Surface Area of Prisms & Cylinders Notes

Name: _____

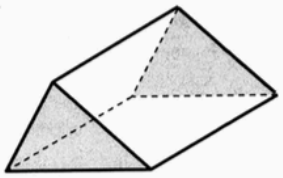
A *prism* is a solid 3-D figure made up entirely of flat surfaces that are polygons.

The faces of a prism are divided into 2 categories: **bases** and **lateral faces.**

A prism is named by what type of base it has.

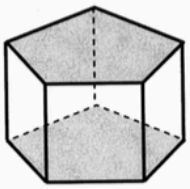
1. Name each of the prisms below.

a.



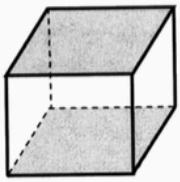
A _____ prism.

b.



A _____ prism.

c.



A _____ prism.

Lateral Area =

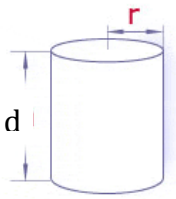
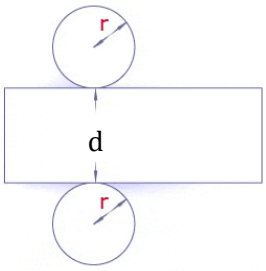
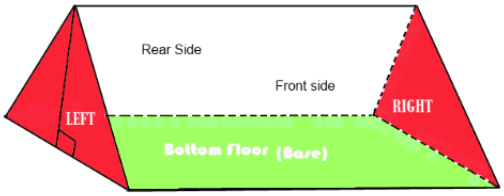
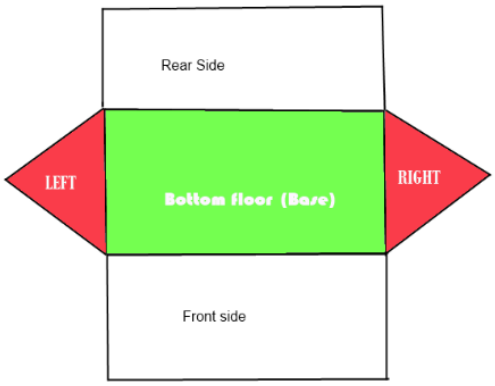
Surface Area =

Review: Fill in the table below

Shape	Area Formula	Perimeter
Circle		C =
Triangle		P = All 3 sides added up
Trapezoid		P = All 4 sides added up
N-Sided Polygon	A = # sides * (Area of )	P = All 5 sides added up
Rectangle		P = 2L + 2W
Square		P =

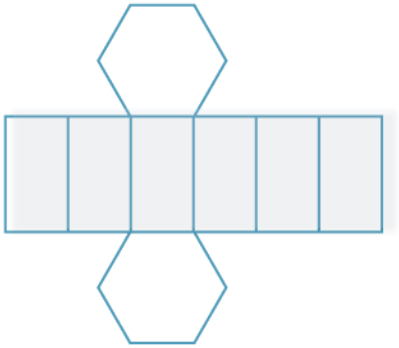
ACTIVITY: Derive the Formula

Directions: Shade the area of the base of the prism in red, the perimeter of the base in brown, and the depth of the prism in green.

	What is the formula or formulas for this 3D particular object?
Cylinder  Net of Cylinder  	S.A. = 2 _____ + _____ Base Area Lateral Area S.A. = 2( ) + d
Triangular Prism  Net of Triangular Prism  	S.A. = 2 _____ + _____ Base Area Lateral Area S.A. = 2( ) + Rear Side / Bottom floor (Base) / Front side
	S.A. = 2( ) + Rear Side + Bottom floor (Base) + Front side

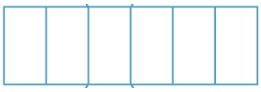
Hexagonal Prism

Net of Hexagonal Prism



S.A. = 2 _____ + _____
Base Area Lateral Area

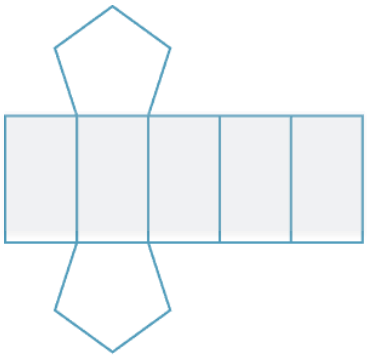
S.A. = 2( ) +



S.A. = 2( ) + + + + + + +

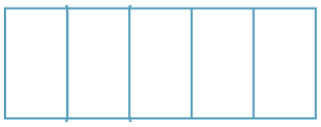
Pentagonal Prism

Net of Pentagonal Prism



S.A. = 2 _____ + _____
Bases Lateral Area

S.A. = 2( ) +

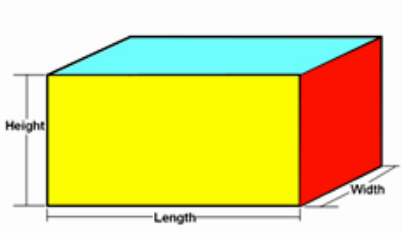


S.A. = 2( )+ + + + + +

What is the general formula for surface area of any prism?

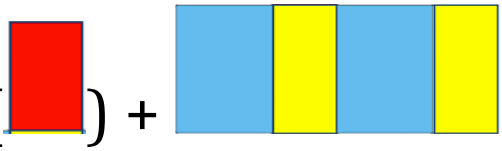
SA_{prism} =

Rectangular Prism

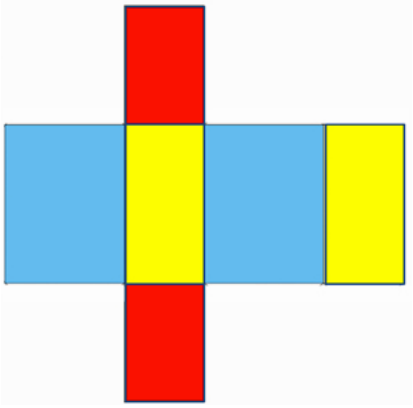


S.A. = 2 _____ + _____
Base Area Lateral Area

S.A. = 2( ) +

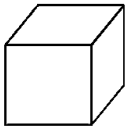


Net of a Rectangular Prism



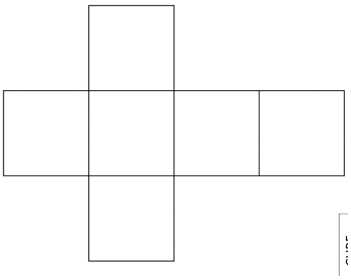
S.A. = 2( )+2( ) + 2( )

Cube



S.A. = 2 _____ + _____
Base Area Lateral Area

Net of a Cube



S.A. = ____( )

Summary:

_____

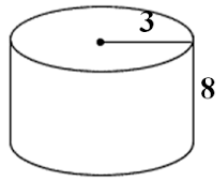
_____

_____

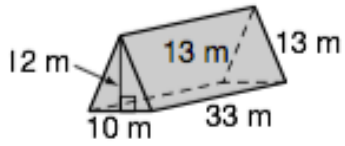
Practice Problems

Fill in the blanks in the directions below.

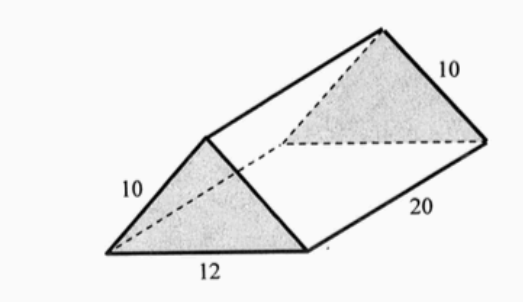
1. Find the lateral area and surface area of the _____, pictured below.



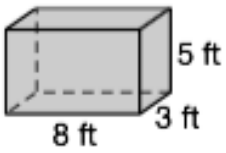
2. Find the lateral area and surface area of the _____ _____, pictured below.



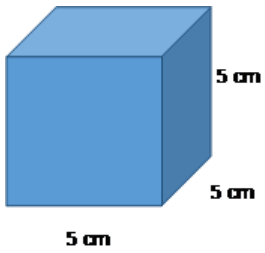
3. Find the lateral area and surface area of the _____ _____, pictured below.



4. Find the surface area of the _____, pictured below.

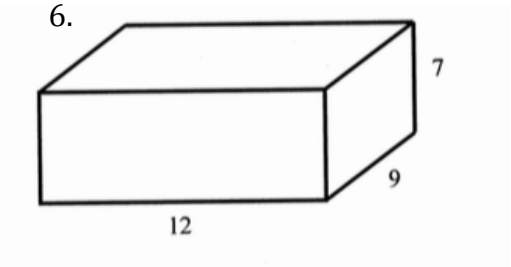


5. Find the surface area of the _____, pictured below.

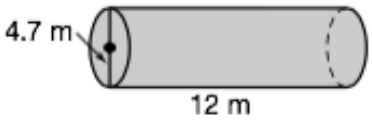


Find the surface area.

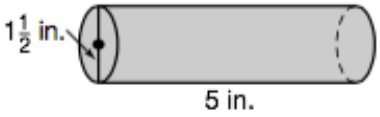
6.



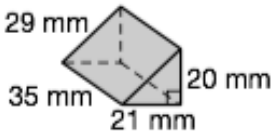
7. .



8.

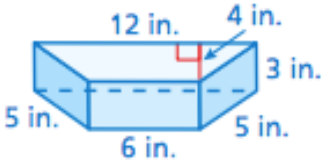


9.

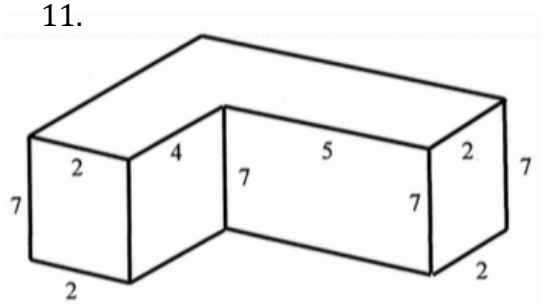


Find the lateral area and surface area. Hint: Shade the area of the base of the prism in red, the perimeter of the base in brown, and the depth of the prism in green.

10.

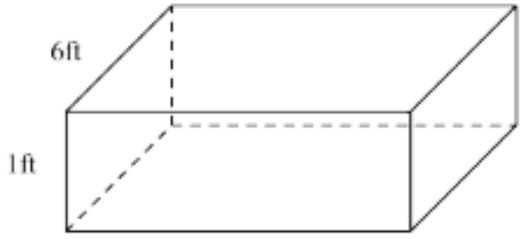


11.

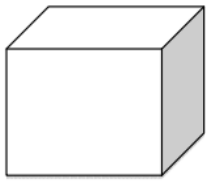


Find the missing length.

16. If the surface area of this rectangular prism is 236 ft^2, then what is the length of the rectangular prism?

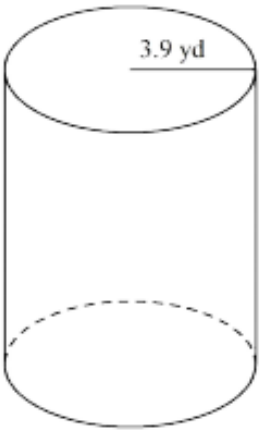


17. A rectangular prism has a surface area of 448 cm^2. Its length is 14 cm and its width is 6 cm. Find its height. (Label each measurement on the picture below)



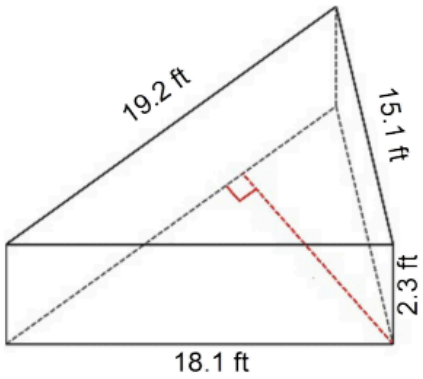
18. Determine the dimensions of a cube, if the surface area is 36 feet squared.

19. If the surface area of this cylinder is 265.51 yd^2, determine the height of the cylinder.



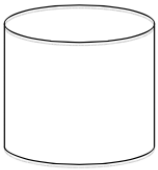
20. If the surface area of this cylinder is 78π ft^2 and the height is 10 ft, determine the radius of the cylinder.

21. The surface area of this triangular prism is 375.88 ft^2. Determine the height of its triangular base.

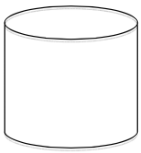


Find the surface area.

22. A cylinder has a radius of 12 cm and a height of 15 cm. Find its surface area. Express your answer in terms of pi, or round your answer to two decimal places. (label what you know on the picture to the left).



23. A cylinder has a diameter of 10 in and a height of 5 in. Find its surface area Express your answer in terms of pi, or round your answer to two decimal places. (label what you know on the picture below)

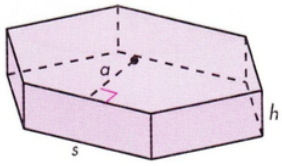


24. *Find the area of a label used to cover a can of juice that has a diameter of 13.5 cm and a height of 15 cm. The label overlaps 1 cm onto itself so glue can be applied.*

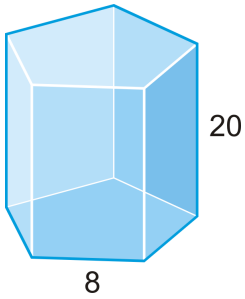
Find the surface area of each solid. Round to the nearest tenth.

24.

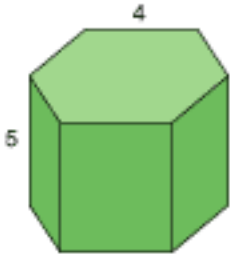
The base is a regular hexagon with apothem $a \approx 12.1$ and side $s \approx 14$. Each lateral face is a rectangle with height $h = 7$.



25.



26.

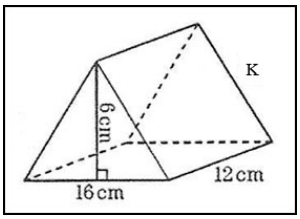


6. 1 Applications

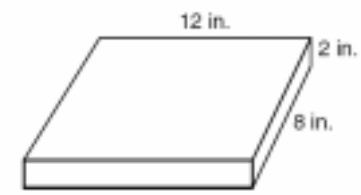
1. **Standardized Test Practice** The height of a cylinder is 10 meters and its diameter is 4 meters. What is its surface area?

   A 75.4 m^2 **B** 138.2 m^2 **C** 150.8 m^2 **D** 351.9 m^2

2. Find the surface area of the triangular prism below.



3. Carl is covering the rectangular prism-shaped box with cloth.
   The dimensions 12in x 2in x 8in

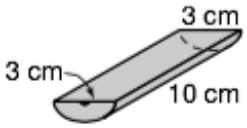


What is the minimum amount of cloth Carl needs to cover the entire box?

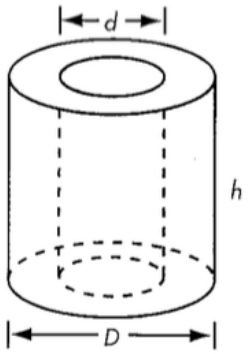
a. 22 in^2
b. 136 in^2
c. 192 in^2
d. 272 in^2

---

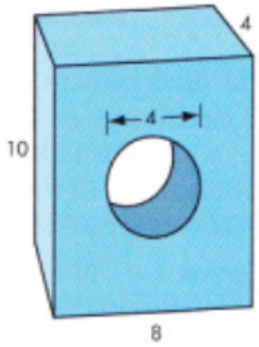
27. Find the surface area.



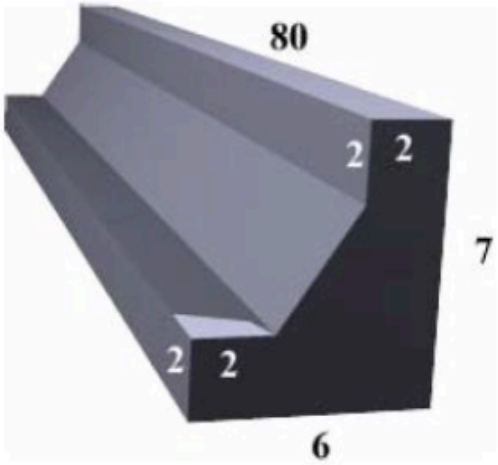
28. Find the surface area. D = 8, d = 4, h = 9



29. * Round your answer to the nearest cm^2.

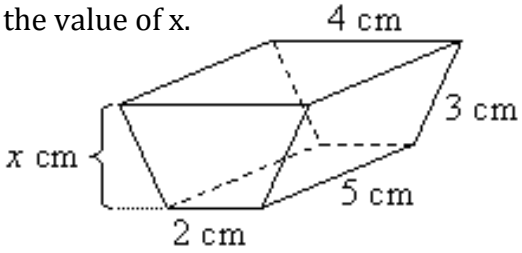


30. A concrete retaining wall is 80 ft long and has a cross section as shown. How many cubic yards of concrete are used in constructing the wall? (Hint: color code if necessary)

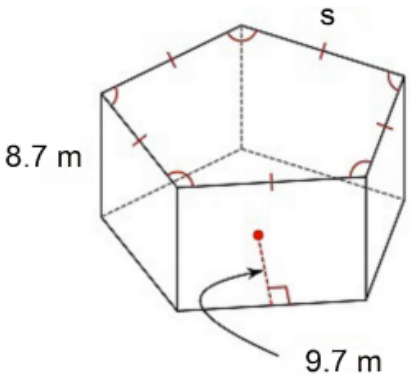


31. Find the radius of the base of a cylinder given that the surface area in 528π square feet and the height is 10 ft.

32. The diagram shows a prism whose base is a trapezoid. The surface area of the prism is 72 cm^2. Find the value of x.



33. The surface area of this pentagonal prism is 1177.6 m2. Determine the side length of its pentagonal base.



s =