

Name: _____

Date: _____ Period: _____

Chapter 9: 3-D Figures

Topic 4: Lateral & Surface Area

Do now:

List the items that need to be memorized from this chapter:

New Symbol Alert! ℓ means "Slant Height"*Picture sliding down the outside of a cone or pyramid**It is written like a cursive lowercase L**Practice writing it:***Surface Area:** The total area of **all of the** _____ of a three-dimensional object.

Picture painting to whole outside of a wooden block... top, bottom, and all sides

Surface Area Formulas:**ANY Regular Prism:**

$SA = \text{Lateral Area (LA)} + \text{Base Areas (2B)}$

Right Circular Cylinder:

$SA = (\pi d)(h) + 2(\pi r^2)$

Cube

$SA = 6(s^2)$

Rectangular Prism

$SA = 2(wh) + 2(hl) + 2(lw)$

Regular Right Pyramid:

$SA = \frac{1}{2}(\text{base perimeter})(\ell) + (\text{base area } (B))$

Right Circular Cone:

$SA = \frac{1}{2}(\pi d)\ell + \pi r^2 \quad \text{OR} \quad SA = \pi r\ell + \pi r^2$

Sphere:

$SA = 4\pi r^2$

Lateral Area: For prisms, pyramids, cylinders, and cones, lateral area is the**total surface area of a figure** _____.

Picture a label on the outside of a soup can, or painting a house... only around the outside.

Lateral Area Formulas:**ANY Regular Prism:**

$LA = (\text{base perimeter}) \cdot (h)$

Right Circular Cylinder:

$LA = (\pi d)(h)$

Cube

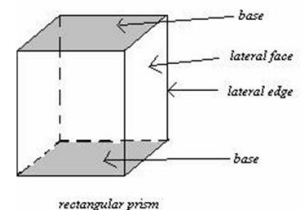
$LA = 4(s^2)$

Regular Right Pyramid:

$LA = \frac{1}{2}(\text{base perimeter}) \cdot (\ell)$

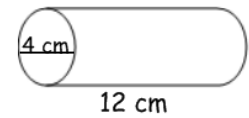
Right Circular Cone:

$LA = \frac{1}{2}(\pi d) \cdot (\ell) \quad \text{OR} \quad LA = \pi r\ell$

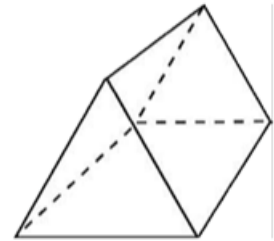
(Lateral area of a sphere is not possible)

Examples:

1. Find the exact values for lateral area and surface area of the cylinder below.



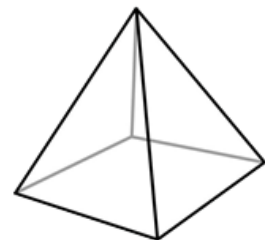
2. A triangular prism has a base with sides measuring 11 cm, 14 cm, and 17 cm. The triangular prism also has a height of 25 cm. Find the lateral area.



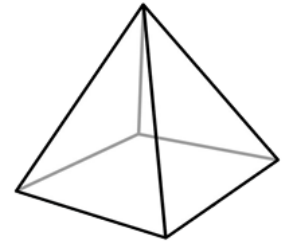
3. A cone has a radius of 3 feet and a height of 4 feet. Find the exact lateral area and surface area.



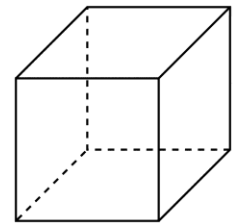
4. A pyramid has a lateral area of 925,344 inches². The base of the pyramid is a square, with sides measuring 756 inches. Find the length of the slant height.



5. Each side of the base of a square pyramid is 6 cm. The total surface area is 132 cm^2 . What is the measure of the slant height?

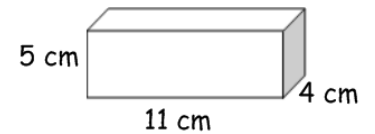


6. The surface area of a cube is 96 cm^2 , what is the length of a side?



7. The rectangular prism shown has a base with length of 4cm and width of 5cm, and height of 11cm.

(a) What is the lateral area of this prism?



(b) What is the surface area of this rectangular prism?

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Topic 4 Homework: Lateral Area & Surface Area

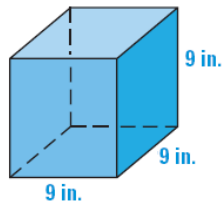
Write the formulas on flashcards. Look online for MY flashcards to ensure you have everything!

- Interior angle sum
- One interior angle
- Exterior angle sum
- One exterior angle
- Area of a Trapezoid
- Surface area of a prism
- Surface area of a cylinder
- Surface area of a rect. prism
- Surface area of a cone
- Surface area of a pyramid
- Surface area of a sphere
- Lateral area of a prism
- Lateral area of a cylinder
- Lateral area of a cone
- Lateral area of a pyramid

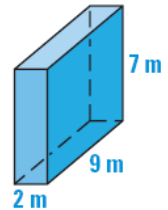
Directions: Answer the following questions completely. Make sure to show all work, including formulas.

For questions 1-4, round all answers to the nearest tenth if necessary.

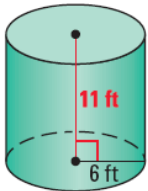
1) Find the Surface Area



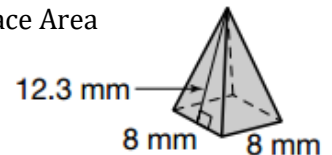
2) Find the Surface Area



3) Find the Lateral Area & Surface Area



4) Find the Lateral Area & Surface Area

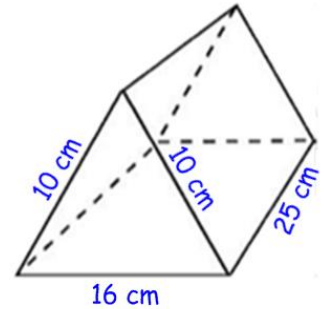


5) A right circular cylinder has an altitude (height) of 11 feet and a radius of 5 feet. To the nearest tenth:
(a) What is the lateral area?

(b) What is the surface area?

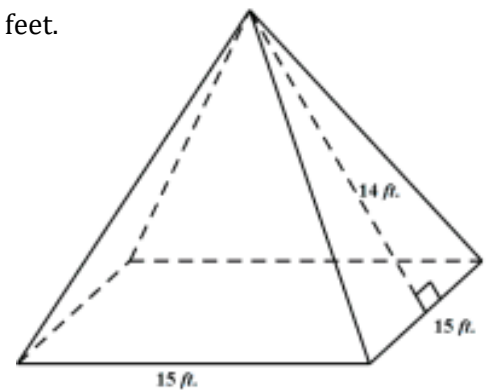
- 6) A right circular cone has a base with a radius of 15 cm, and a slant height of 25 cm. In terms of π , find:
- (a) The lateral area of the cone.
- (b) The surface area of the cone.

- 7) Find the lateral area of the following prism with a triangular base.
Bonus: Find the surface area (you'll find Pythagorean Theorem hiding in here!)



- 8) The lateral area of a right circular cone is equal to $120\pi cm^2$. If the base of the cone has a diameter of 24cm, what is the length of the slant height?
- (1) 2.5 (2) 5 (3) 10 (4) 15.7

- 9) A square pyramid has a base length of 15 feet and a slant height of 14 feet.
- (a) What is the lateral area of the square pyramid?

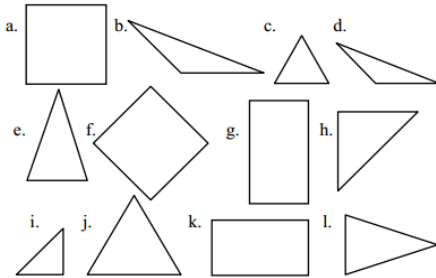


- (b) What is the surface area of the square pyramid?

10) Tim is going to paint a wooden sphere that has a diameter of 12 inches. Find the surface area of the sphere to the nearest square inch.

Review Section:

11) Which of the following statements is **false** according to the images below?



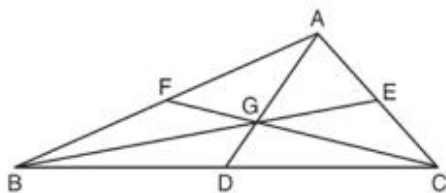
- (1) g and k are similar
- (2) c and j are similar
- (3) a and f are similar
- (4) b and d are congruent

12) What is $(r_{x-axis}(T_{(-2,3)}(B)))$ on the point $B(-2,8)$?

13) Which set of numbers does not represent the sides of a **right** triangle?

- (1) {6,8,10}
- (2) {8,15,17}
- (3) {8,24,25}
- (4) {15,36,39}

15) In the diagram below of $\triangle ABC$, medians \overline{AD} , \overline{BE} , and \overline{CF} intersect at G .



If $CF = 24$, what is the length of \overline{FG} ?

- 1) 8
- 2) 10
- 3) 12
- 4) 16

(Hint: Medians... 1-2-3 Rule!)

16) Point A is on line m . How many distinct planes will be perpendicular to line m and pass through point A ?

- 1) one
- 2) two
- 3) zero
- 4) infinite