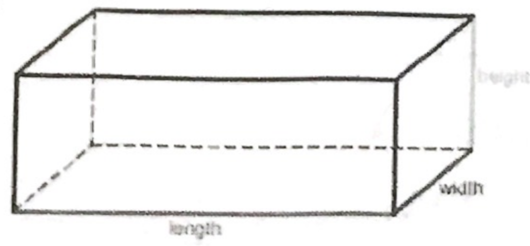
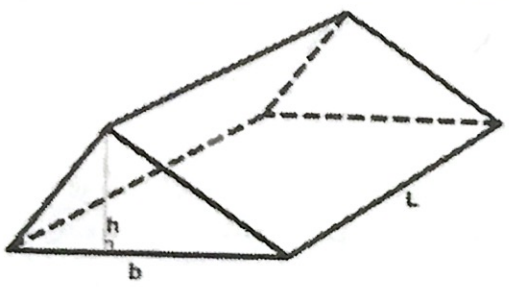
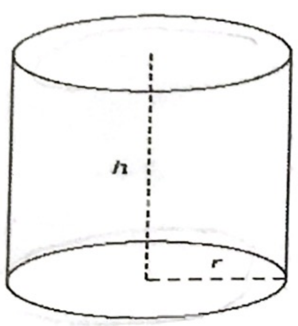
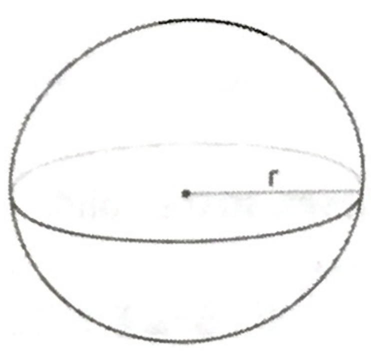
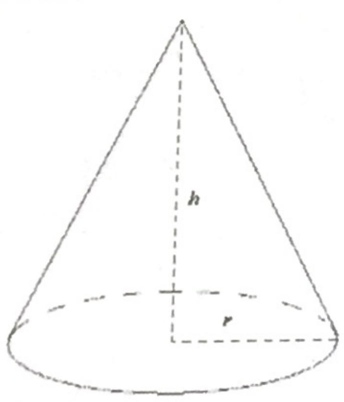
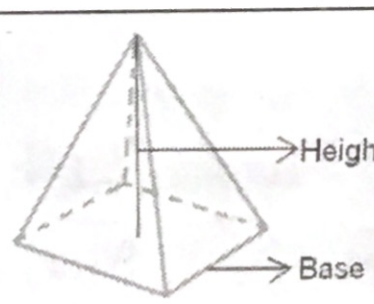
Name: Key Date:

Unit 8b Review Sheet

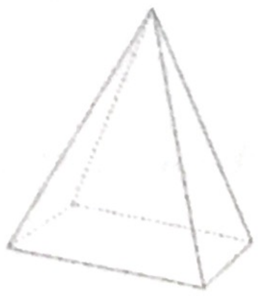
Figure	Name	Volume Formula	Surface Area Formula
1. 	rectangular prism	$V=(l\cdot w)\cdot h$	SA: $2LW+2WH+2LH$
2. 	triangular prism	$V=(\frac{1}{2}bh)\cdot h$	SA: area of 3 rectangles + area of 2 triangles
3. 	cylinder	$V=(\pi r^2)\cdot h$	SA: $2(\pi r^2)+(\pi d)(h)$
4. 	sphere	$V=\frac{4}{3}\pi r^3$	X
5. 	cone	$V=\frac{1}{3}(\pi r^2)\cdot h$	X
6. 	rectangular pyramid	$V=\frac{1}{3}(l\cdot w)\cdot h$	SA: area of 4 triangles + area of rectangle
7. 	triangular pyramid	$V=\frac{1}{3}(\frac{1}{2}b\cdot h)\cdot h$	SA: area of 4 triangles

**** Don't Forget:** *Circumference* $=\pi d$ *Area of circle* $=\pi r^2$

Area of Trapezoid = $1/2\,(b_1+b_2)(h)$ *Area of Semicircle:* $(\pi r^2)/2$

Find the ***a) Vertical Cross Section*** and ***b) Horizontal Cross Section*** of:

8.

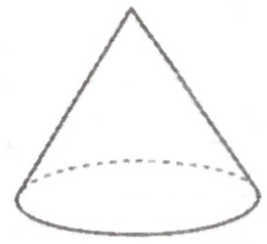


a) Vertical: triangle
b) Horizontal: rectangle

9.

a) Vertical: rectangle
b) Horizontal: circle

10.



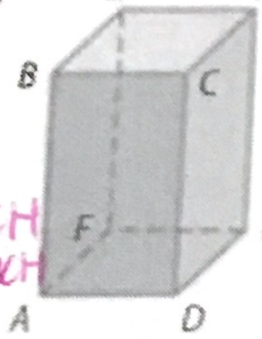
a) Vertical: △
b) Horizontal: circle

Lesson 12-4 Three-Dimensional Figures (pp. 574–579)

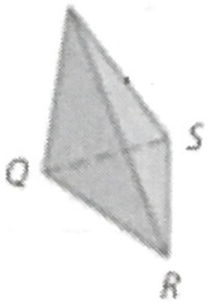
Identify each figure. Name the bases, faces, edges, and vertices. **Complete #11-14 Below in space**

bases:
□EBCH
□AFGD
faces:
□BCDA ~~□EBCH~~
□CHGD ~~□EBCH~~
□BEFA
□EHGF
edges:
$\overline{BE}$, $\overline{EH}$, $\overline{HC}$, $\overline{CB}$, $\overline{EF}$, $\overline{HG}$, $\overline{CD}$, $\overline{BA}$, $\overline{AF}$, $\overline{FG}$, $\overline{GD}$, $\overline{AD}$
vertices:
B, E, H, C, F, G, D, A

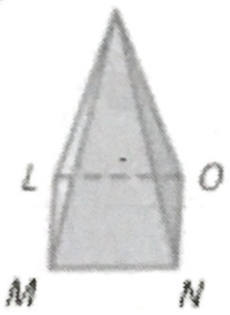
11.



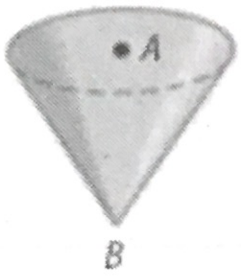
12.



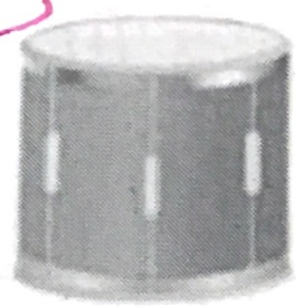
13.



14.

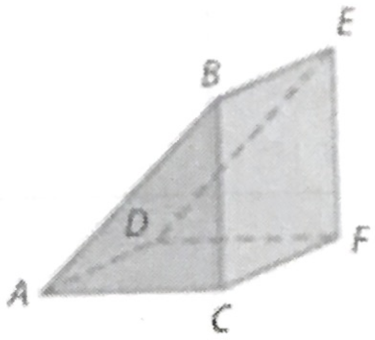


15. Draw the top view and side view of the drum. Then draw and describe the shape resulting from a vertical cross section of the figure.



Example 4

Identify the figure. Name the bases, faces, edges, and vertices.



There are two congruent triangular bases, so the solid is a triangular prism.

bases: *ABC*, *DEF*

faces: *ABED*, *BCFE*, *ACFD*, *ABC*, *DEF*

edges: $\overline{AB}$, $\overline{BC}$, $\overline{AC}$, $\overline{DE}$, $\overline{EF}$, $\overline{DF}$, $\overline{AD}$, $\overline{BE}$, $\overline{CF}$

vertices: *A*, *B*, *C*, *D*, *E*, *F*

11. Bases:
Faces:
Edges:
Vertices:

13. Bases: □LOMN
(5) Faces: △PMN, △PON, △PLM, △PLO, □LOMN
Edges: $\overline{PL}$, $\overline{PO}$, $\overline{PN}$, $\overline{PM}$, $\overline{MN}$, $\overline{LO}$, $\overline{LM}$, $\overline{ON}$
Vertices: P, L, O, M, N.

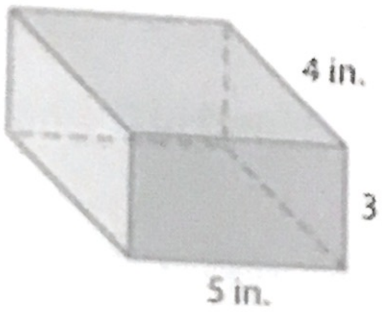
12. Bases: △QSR
(4) Faces: △QTR, △TSR, △TQS, △QSR
Edges: $\overline{TQ}$, $\overline{TS}$, $\overline{SR}$, $\overline{QR}$
Vertices: T, Q, S, R

14. Bases: ⊙A
Faces: ~~[illegible]~~ ⊙A
Edges: none
Vertices: B

Lesson 12-5 Volume of Prisms (pp. 580–585)

Find the volume of each prism. $V = Bh$ ← area of base

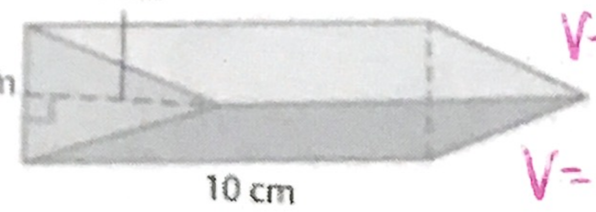
16.



$V = (l \cdot w)(h)$

$V = (5 \cdot 4)(3) = \boxed{60 in^3}$

17.



$V = (\frac{1}{2}bh)(h)$

$V = (\frac{1}{2} \cdot 3 \cdot 4)(10)$ $\boxed{60 cm^3}$

18. A shipping box is 11 inches long, 8.5 inches wide, and 5.5 inches high. What is the volume of the box? $V = l \cdot w \cdot h$ $11 \times 8.5 \times 5.5 = \boxed{514.25 in^3}$

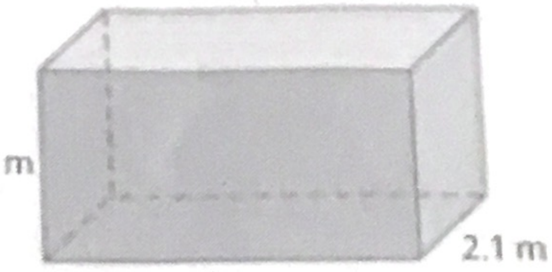
19. Sandra is filling a keepsake storage box that is 40.5 centimeters long, 28 centimeters wide, and 17 centimeters high. What is the volume of the box?

$V = l \cdot w \cdot h$

$(40.5)(28)(17) = \boxed{19278 cm^3}$

Example 5

Find the volume of the rectangular prism.



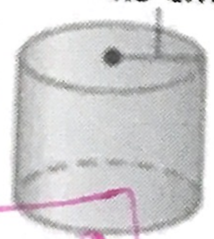
$V = \ell wh$	Volume of a prism
$V = 8 \cdot 2.1 \cdot 4.5$	Replace ℓ with 8, w with 2.1, and h with 4.5.
$V = 75.6\ m^3$	Simplify.

The volume of the prism is 75.6 cubic meters.

Lesson 12-6 Volume of Cylinders (pp. 586–590)

Find the volume of each cylinder. Round to the nearest tenth, if necessary. $\pi r^2 h$

20.



$\pi (4.5)^2 \cdot 7$

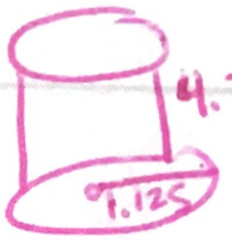
$= \boxed{445.3 cm^3}$

21.

$\pi (3)^2 (10)$

$= \boxed{282.7 in^3}$

22. A 12-ounce can of soda measures $4\frac{3}{4}$ inches high with a radius of $1\frac{1}{8}$ inches. Find the amount of soda that can fit in the can. Round to the nearest tenth.



$\pi r^2 h$

$\pi (1.125)^2 \times 4.75$

$= \boxed{18.9 in^3}$

Example 6

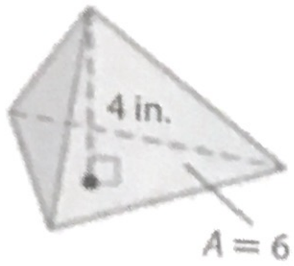
Find the volume of the cylinder. Round to the nearest tenth, if necessary.

$V = \pi r^2 h$	Volume of a cylinder
$V = \pi(1.55)^2(5.5)$	Replace r with 1.55 and h with 5.5.
$V \approx 41.5\ m^3$	Simplify.

Lesson 12-7 Volume of Pyramids, Cones, and Spheres (pp. 595–600)

Find the volume of each figure. Round to the nearest tenth, if necessary.

23.



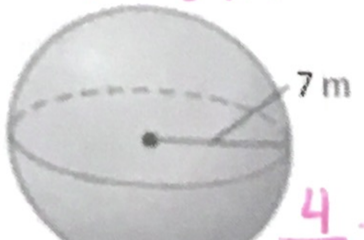
$V=\frac{1}{3}(B)(h)$

$V=\frac{1}{3}(6)(4)$

$\boxed{8\ in^3}$

24.

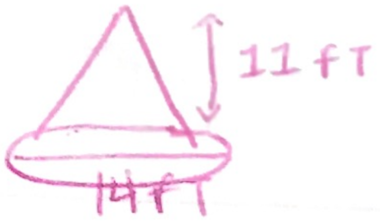
$V=\frac{4}{3}\pi r^3$



$\frac{4}{3}\pi(7)^3$

$=\boxed{1436.8\ m^3}$

25. Mr. Owens built a conical storage shed with a base 14 feet in diameter and a height of 11 feet. What is the volume of the shed?



$V=\frac{1}{3}\pi r^2 h$

$\frac{1}{3}\pi(7)^2\cdot 11$

$=\boxed{564.4\ ft^3}$

Example 7

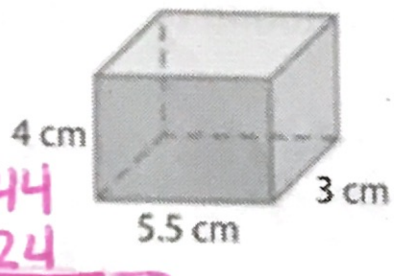
Find the volume of the cone. Round to the nearest tenth, if necessary.

$V=\frac{1}{3}\pi r^2 h$	Volume of a cone
$=\frac{1}{3}\pi(4.1)^2(6.2)$	Replace r with 4.1 and h with 6.2.
$\approx 109.1\ m^3$	Simplify.

Lesson 12-8 Surface Area of Prisms (pp. 603–607)

Find the lateral and surface area of each prism. Round to the nearest tenth, if necessary.

26.



LA: (will differ)

$4(5.5)=22\times 2=44$

$4(3)=12\times 2=24$

$\boxed{68cm^2}$

SA:

5)=16.5

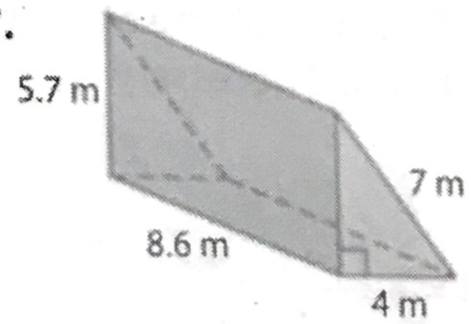
× 2

33

+ 68

$\boxed{101\ cm^2}$

27.



L.A: (3 rectangles)

L·W

□ $5.7\times 8.6=49.02$

□ $8.6\times 4=34.4$

□ $8.6\times 7=+60.2$

$\boxed{143.62\ m^2}$

S.A: △ $\frac{1}{2}bh$ $\frac{1}{2}(4)(5.7)=11.4\ m^2$

△ = 11.4 m²

11.4

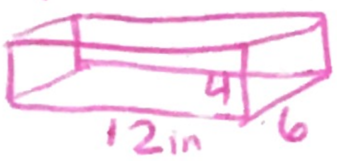
+11.4

143.62

S.A: 6.42m²

28. Sarah is wrapping a gift that is 12 inches long, 6 inches wide, and 4 inches high. How many square inches of paper are needed to cover the gift?

rectangular prism



$12(4)\cdot 2=96$

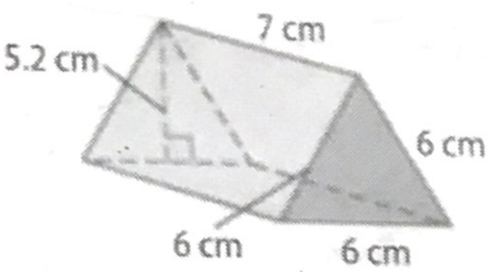
$4(6)\cdot 2=48$

$12(6)\cdot 2=+144$

$288\ in^2$

Example 8

Find the lateral and surface area of the prism.



$L=Ph$	Lateral area of a prism
$=(6+6+6)7$	$P=$ the perimeter of the base
$=126\ cm^2$	Simplify.
$S=L+2B$	Surface area of a prism
$=126+2\left(\frac{1}{2}\cdot 6\cdot 5.2\right)$	$B=\frac{1}{2}bh$
$=157.2\ cm^2$	Simplify.

Lesson 12-9 Surface Area of Cylinders (pp. 610–614)

Find the lateral and surface area of each cylinder. Round to the nearest tenth, if necessary.

29.

L.A: L · W

$(\pi d)(h)$

$(\pi)(9)(13.4)$

$= \boxed{378.9 \text{ in}^2}$

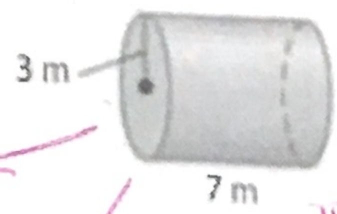
S.A: $\pi r^2 \times 2$ $\pi(4.5)^2 \times 2$

$= 127.2345$

$+ 378.9$

S.A: $\boxed{506.1 \text{ in}^2}$

31.



LA: $\pi(6)(7)$ $= \boxed{131.9 \text{ m}^2}$ LA

S.A.

$\pi r^2 \times 2$

$\pi(3)^2 \times 2$

$= 56.5487$

$+ 131.9$

188.4 m²

33. A cable is covered by rubber sheathing and has a diameter of 3 millimeters. How much rubber sheathing is there in 100 centimeters of cable?

$\pi(1.5)^2$

$\times 2$

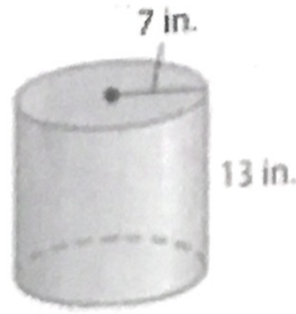
14.1372 ← circles

$+ \pi(3)(100) = 942.4778$ LA

Total = 956.6 cm²

Example 9

Find the lateral and surface areas of the cylinder below. Round to the nearest tenth, if necessary.



Lateral Area

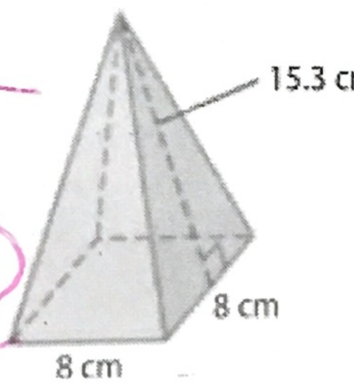
$L = 2\pi rh$	Lateral area of a cylinder
$= 2 \cdot \pi \cdot 7 \cdot 13$	Replace r with 7 and h with 13.
$\approx 571.8 \text{ in}^2$	Simplify.

Surface Area

$S = L + 2\pi r^2$	Surface area of a cylinder
$= 571.8 + 2\pi(7)^2$	Replace L with 571.8 and r with 7.
$\approx 879.7 \text{ in}^2$	Simplify.

Find the lateral and surface areas of each figure. Round to the nearest tenth, if necessary.

34.



LA:

$\frac{1}{2}(8)(15.3)$

$= 61.2$

$\times 4$

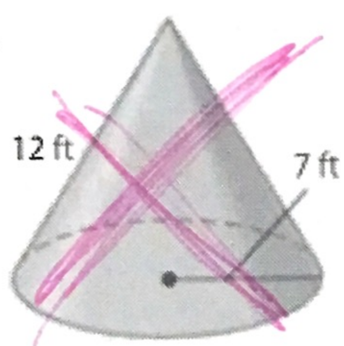
244.8 cm²

SA: 64

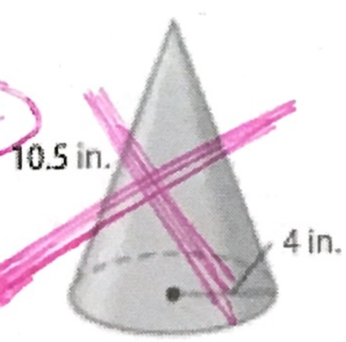
$+ 244.8$

308.8 cm²

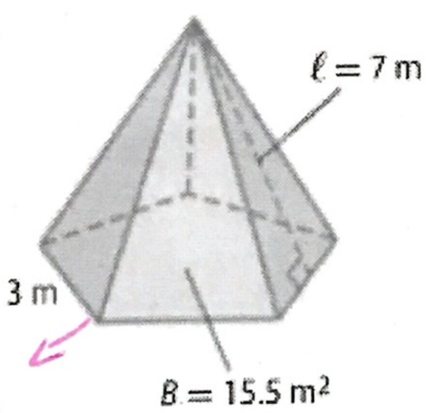
35.



36.



37.



$\frac{1}{2}bh$

$\frac{1}{2}(3)(7)$

$= 10.5 \times 5 = $ 52.5 m² ← LA

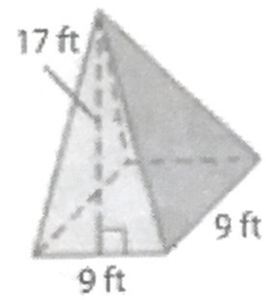
SA: 52.5

$+ 15.5$

68 m²

Example 10

Find the lateral and surface area of the square pyramid.



Lateral Area

$L = \frac{1}{2}P\ell$	Lateral area of a pyramid
$= \frac{1}{2}(4 \cdot 9)(17)$	Substitute.
$= 306 \text{ ft}^2$	Simplify.

Surface Area

$S = L + B$	Surface area of a pyramid
$= 306 + 9^2$	Substitute.
$= 387 \text{ ft}^2$	Simplify.

38. A pyramid-shaped roof has a slant height of 18 feet and its square base is 55 feet wide. How many square feet of roofing material is needed to cover the roof?

$\frac{1}{2}(55)(18) \times 4$

$=$ 1980 ft²