NAME_____

3D Geometry Review:

Surface Area, and Volume

1. Explain what *surface area* of an object describes.

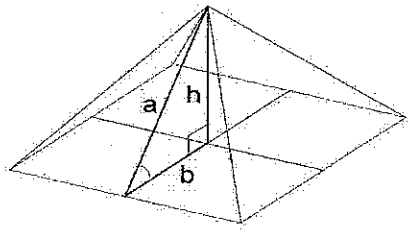
The space on the outside of the object.
(The "package".)

2. Explain what *volume* of an object describes.

The space on the inside of an object.
(How much it will hold.)

3. When finding the surface area of a pyramid, which height do you use?

Straight Height or (Slant Height)



4. When finding the volume of a pyramid, which height do you use?

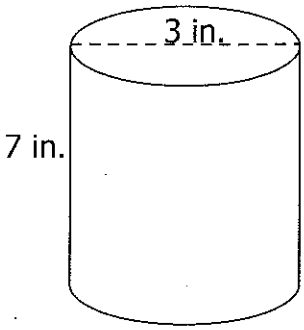
(Straight Height) or Slant Height

5. Fill in the blanks below...

	Total # of Faces	Shape of Base
a. Triangular Prism	5	triangle
b. Pentagonal Prism	7	pentagon
c. Square Pyramid	5	Square
d. Hexagonal Pyramid	7	hexagon

. For each of the following...
- ✓ Name the figure
- ✓ Find the Surface Area – show your work.
- ✓ Find the Volume – show your work.

a.



NAME: Cylinder

Surface Area - (Formula: $2\pi r^2 + h \cdot 2\pi r$)

$SA = 2\pi \cdot 1.5^2 + 7 \cdot 2\pi \cdot 1.5$

$SA = 14.13 + 65.94$

$SA = \boxed{80.1\ in^2}$

Volume - (Formula: A of B x h.)

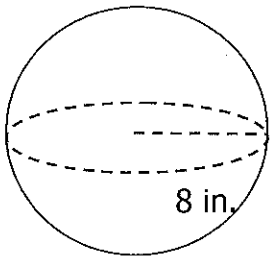
$A = \pi \cdot 1.5^2$

$A = 7.065$

$V = 7.065 \times 7$

$\boxed{V \approx 49.5\ in^3}$

b.



NAME: Sphere

Surface Area - (Formula: $SA = 4\pi r^2$)

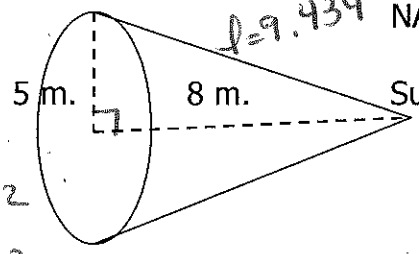
$SA = 4 \cdot \pi \cdot 8^2$

$\boxed{SA = 803.8\ in^2}$

Volume - (Formula: $\frac{4}{3}\pi r^3$)

$V = \frac{4}{3}\pi \cdot 8^3$ $\boxed{= 2143.6\ in^3}$

c.



$l = 9.434$

NAME: Cone

Surface Area - (Formula: $\pi r^2 + \pi \cdot r \cdot l$)

$SA = \pi \cdot 5^2 + \pi \cdot 5 \cdot 9.434$

$SA = 78.5 + 148.114$

$\boxed{SA = 226.6\ m^2}$

$5^2 + 8^2 = l^2$

$25 + 64 = l^2$

$\sqrt{89} = \sqrt{l^2}$

$l \approx 9.434$

Volume - (Formula: $\frac{1}{3} \cdot A$ of B $\cdot h$)

$A = \pi r^2$

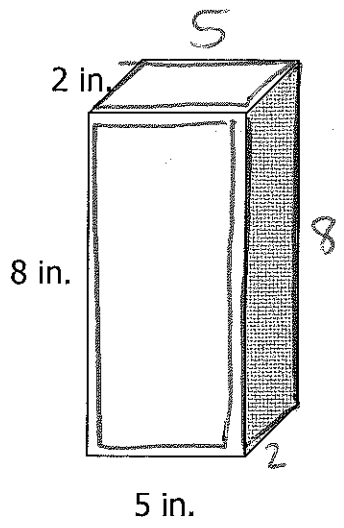
$A = \pi \cdot 5^2$

$A = 78.5$

$V = \frac{1}{3} \cdot 78.5 \cdot 8$

$\boxed{V = 209.3\ m^3}$

d.



NAME: Rectangular Prism

Surface Area:

T+B	Sides	B+F
2×5 = 10	8·2 = 16	8·5 = 40
10×2 = 20	16×2 = 32	40×2 = 80

20 + 32 + 80 = $132\ in^2$

Volume:

V = A of B × height

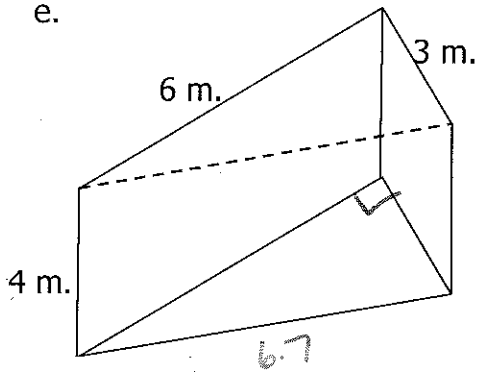
V = 10 · 8

$V = 80\ in^3$

A = 2 × 5

A = 10

e.



NAME: Triangular Prism

Surface Area:

2 Triangles (same)	3 rectangles (Diff)
$A = \frac{1}{2} \cdot b \cdot h$	6·4 = 24
$A = \frac{1}{2} \cdot 6 \cdot 3$	3·4 = 12
A = 9	6.7·4 = 26.8
9×2 = 18	62.8

18 + 62.8 = $80.8\ m^2$

Volume:

V = A of B × h

V = 9 · 4

$V = 36\ m^3$

$a^2 + b^2 = c^2$

$3^2 + 6^2 = c^2$

$9 + 36 = c^2$

$\sqrt{45} = \sqrt{c^2}$

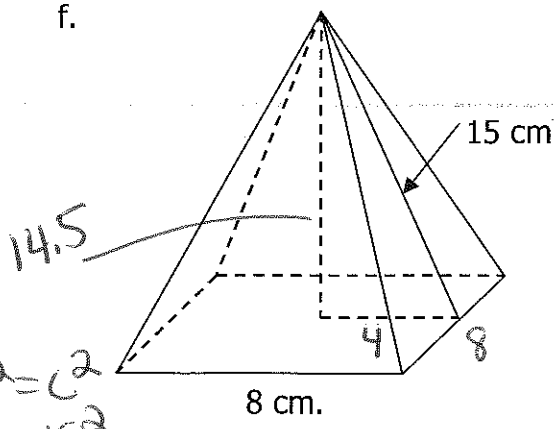
$c \approx 6.7$

$A = \frac{1}{2} \cdot b \cdot h$

$A = \frac{1}{2} \cdot 6 \cdot 3$

A = 9

f.



NAME: Square Pyramid

Surface Area:

1 square

$8 \times 8 = 64$

4 triangles

$A = \frac{1}{2} b \cdot h$

$A = \frac{1}{2} \cdot 8 \cdot 15$

$A = 60$

$60 \times 4 = 240$

$64 + 240 = 304\ cm^2$

$a^2 + b^2 = c^2$

$4^2 + b^2 = 15^2$

$16 + b^2 = 225$

$-16 \quad -16$

$\sqrt{b^2} = \sqrt{209}$

$b \approx 14.5$

$A = 8 \cdot 8$

$A = 64$

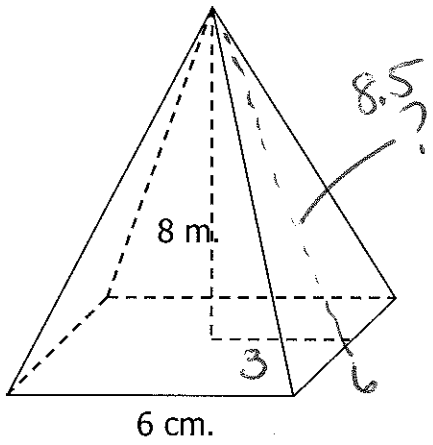
Volume:

$V = \frac{1}{3} \cdot A\ of\ B \cdot H$

$V = \frac{1}{3} \cdot 64 \cdot 14.5$

$V = 309.3\ cm^3$

g.



NAME: Square Pyramid

Surface Area:

1 square

$6 \times 6 = 36$

4 triangles

$A = \frac{1}{2} \cdot b \cdot h$

$A = \frac{1}{2} \cdot 6 \cdot 8.5$

$A = 25.5$

$25.5 \times 4 = 102$

$36 + 102 = 138\ cm^2$

$a^2 + b^2 = c^2$

$3^2 + 8^2 = c^2$

$9 + 64 = c^2$

$\sqrt{73} = \sqrt{c^2}$

$c \approx 8.5$

Area

$6 \cdot 6 = 36$

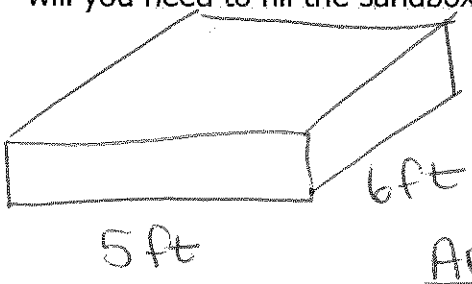
Volume:

$V = \frac{1}{3} \cdot A\ of\ B \cdot h$

$V = \frac{1}{3} \cdot 36 \cdot 8$

$V = 96\ cm^3$

7. You are helping your dad to build a sandbox for you little brother. The sandbox is in the shape of a rectangular prism that is 5 feet wide, 6 feet long, and 1 foot tall. How much sand will you need to fill the sandbox?



$V = A \text{ of } B \times h$

$V = 30 \times 1$

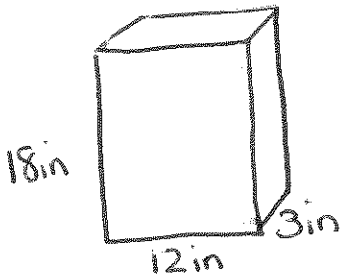
$V = 30 \text{ ft}^3$

Area

$5 \cdot 6 = 30$

8. You work for a cereal company and are designing a new cereal box. The box measures 12 inches wide, 18 inches tall, and 3 inches deep.

a. How much cardboard will you need to make each cereal box.



T + B

$12 \cdot 3 = 36$

$36 \times 2 = 72$

L + R

$18 \times 3 = 54$

$54 \times 2 = 108$

F + B

$12 \times 18 = 216$

$216 \times 2 = 432$

$72 + 108 + 432 = 612 \text{ in}^2$

b. How much cereal can you fit into your box?

Area

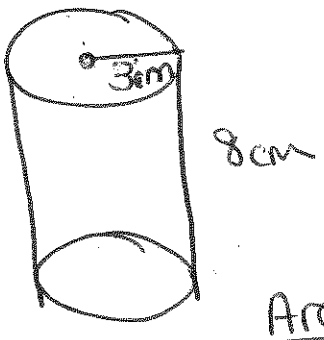
$12 \cdot 3 = 36$

$V = A \text{ of } B \times h$

$V = 36 \times 18$

$V = 648 \text{ in}^3$

9. A can has a radius of 3 cm and a height of 8 cm. Find the volume of the can in mL.



$V = A \text{ of } B \times h$

$V = 28.26 \times 8$

$V = 226.1 \text{ cm}^3$

or

Area

$C = \pi r^2$

$C = \pi \cdot 3^2$

$C = 28.26$