3-D Geometry

(Volume & Surface Area)

## Formula(s):

Example 1:

Find the volume.
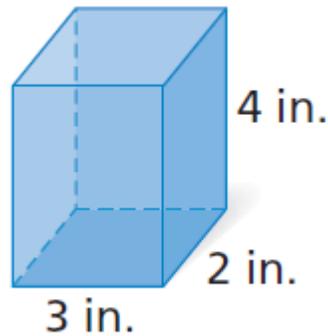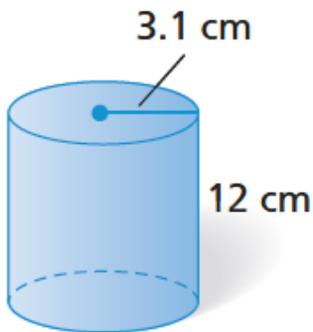
4 in.

2 in.

3 in.

Example 15:

Find the approximate volume in square inches.

3.1 cm

12 cm

Example 16:

Find the approximate volume in cubic feet.

4 m

2 m

3 m

Measurement in 3-D Figures

# Example 13:

Find the approximate surface area in square inches.

15 mm

10 mm

Example 14:

Find the approximate volume in cubic centimeters.

2 in.

1 in.

6 in.

Example 2:

Find the volume.

13 cm

7 cm

8 cm

Example 3:

Find the volume. Use 3.14 for pi.

4.2 mm

7.5 mm
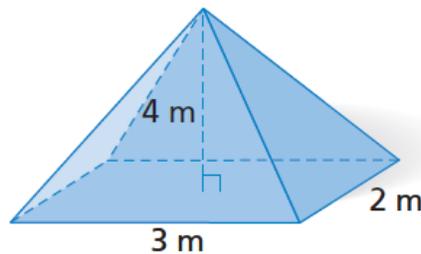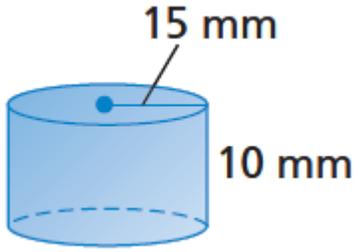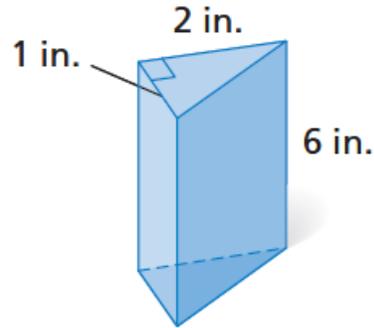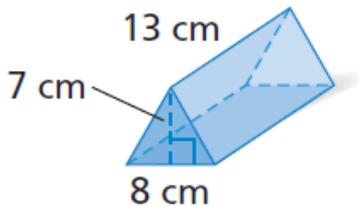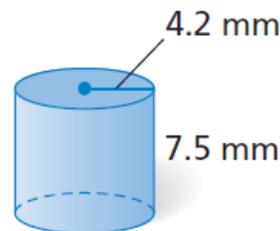
Volume of Prisms & Cylinders

Formula(s)

Example 4:
Find the volume.
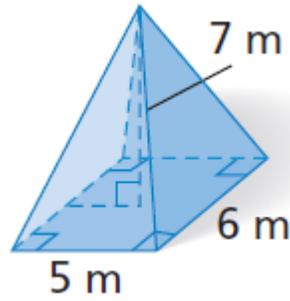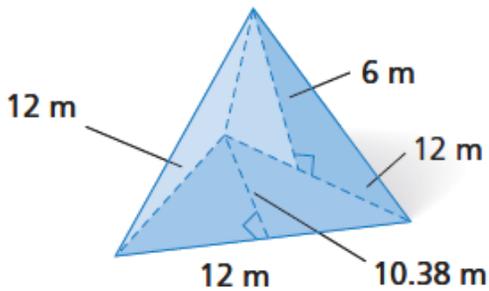
7 m

6 m

5 m

Example 11:
Find the surface area.

12 m

6 m

12 m

12 m

10.38 m

Example 12:
Find the surface area. Use 3.14 for pi.

10 cm

3 cm
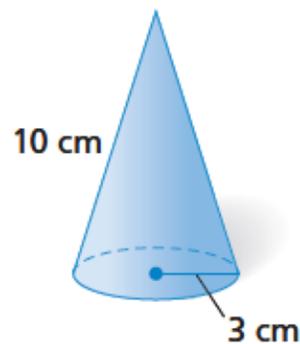
Surface Area of Pyramids & Cones

Formula(S)

Example 10:
Find the surface area.
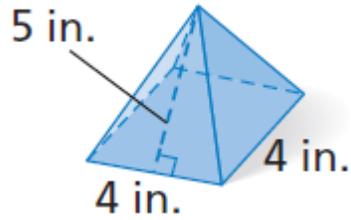
5 in.

4 in.

4 in.

Example 5:
Find the volume.

8 in.

9 in.   5 in.

Example 6:
Find the volume. Use 3.14 for pi.

4.2 yd

8 yd
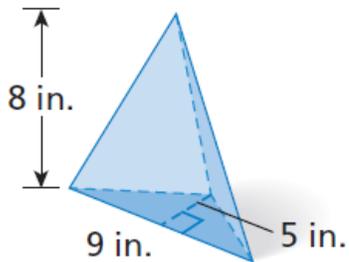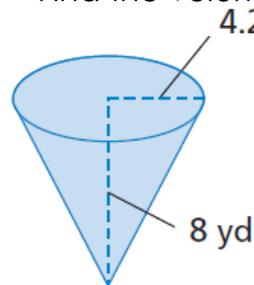
Volume of Pyramids & Cones

Formula(s)

Example 7:
Find the surface area.
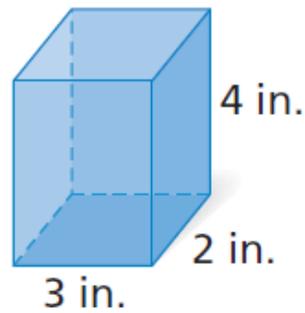
4 in.

2 in.

3 in.

Example 8:
Find the surface area.

14.9 mm

8 mm

20 mm

10 mm

12 mm

Example 9:
Find the surface area. Use 3.14 for pi.

3 cm

4 cm
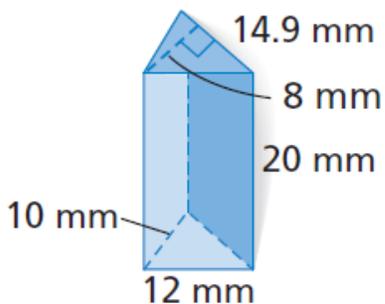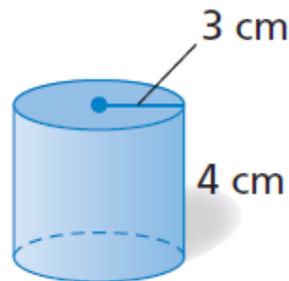
Surface Area of Prisms & Cylinders

Answer Key!

Note: I have written this answer key based on the formulas found on the Florida FCAT 2.0 Reference Sheet.

3-D Geometry
(Volume & Surface Area)

Formula(s)

$V = Bh$

*Remember **B = Area of Base**

| Rectangular	Triangular	Cylinder
$B = bh$	$B = \frac{1}{2}bh$	$B = \pi r^2$

Example 1:

Find the volume.
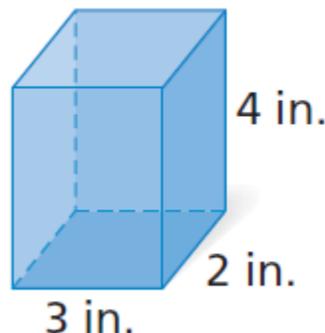
$V = Bh$
$V = (bh)h$
$V = (3\text{in} \cdot 2\text{in}) \cdot 4\text{in}$
$V = 24\text{in}^3$

4 in.

2 in.

3 in.

Example 15:

Find the approximate volume in square inches.

3.1 cm ~1.22 in

12 cm ~4.72 in
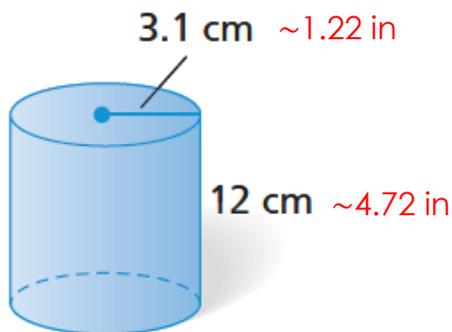
$V = Bh$
$V = (\pi r^2)h$
$V = (3.14 \cdot 1.22^2) \cdot 4.72\text{in}$
$V = 22.1\text{in}^3$

Example 16:

Find the approximate volume in cubic feet.

~13.1 ft

4 m

2 m ~5.6 ft

3 m
~9.8 ft
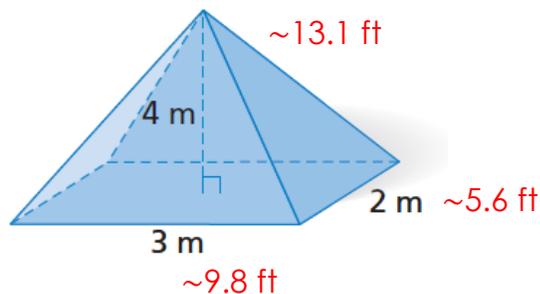
$V = \frac{1}{3}Bh$
$V = \frac{1}{3}(bh)h$
$V = \frac{1}{3}(9.8\text{ft} \cdot 5.6\text{ft}) \cdot 13.1 \text{ ft}$
$V = 239.6 \text{ ft}^3$

Measurement in 3-D Figures

Example 13:

Find the approximate surface area in square inches.

15 mm ~0.59 in

10 mm ~0.24 in
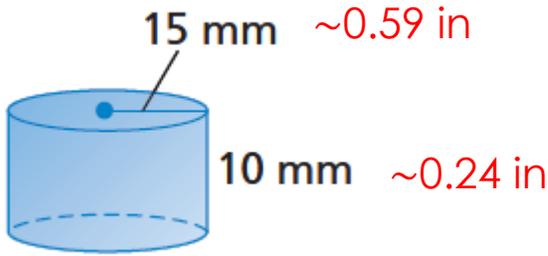
$SA = 2\pi r^2 + 2\pi rh$

$SA = 2(3.14)(0.59^2) + 2(3.14)(0.59)(0.24)$
$SA = 2.19 + 0.89$
$SA = 3.08\ in^2$

Example 14:

Find the approximate volume in cubic centimeters.

~2.54 cm ~5.08 cm
2 in.
1 in.

6 in. ~15.24 cm

$V = Bh$
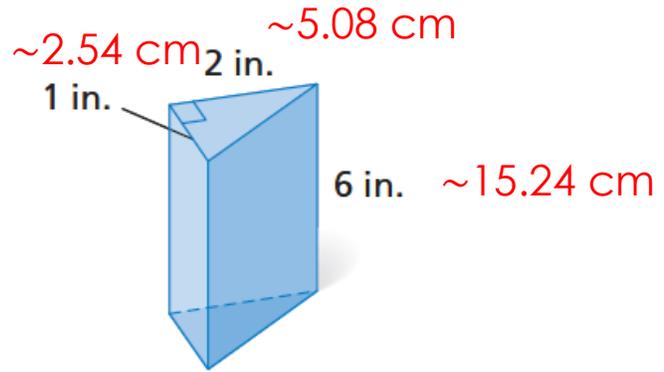
$V = (\frac{1}{2}bh)h$
$V = (0.5)(2.54cm)(5.08cm)(15.24cm)$
$V = 98.3\ cm^3$

Example 2:

Find the volume.

13 cm

7 cm

8 cm

$V = Bh$
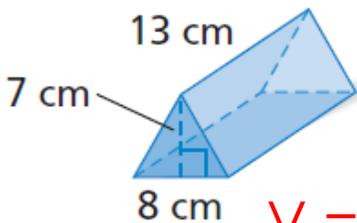
$V = (\frac{1}{2}bh)h$
$V = (0.5)(8cm)(7cm)(13cm)$
$V = 364\ cm^2$

Example 3:

Find the volume. Use 3.14 for pi.
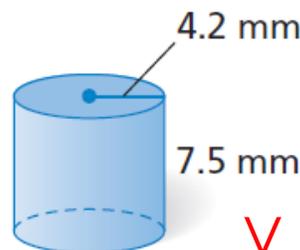
4.2 mm

7.5 mm

$V = Bh$

$V = (\pi r^2)h$
$V = (3.14)(4.2mm)^2(7.5mm)$
$V = 415.4\ mm^3$

Volume of Prisms & Cylinders

Formula(s)

$V = \frac{1}{3}Bh$

Rectangular   Triangular   Cone

$B = bh$ $B = \frac{1}{2}bh$ $B = \pi r^2$

Example 4:

Find the volume.

7 m
6 m
5 m
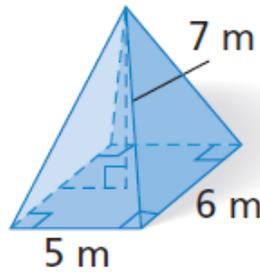
$V = \frac{1}{3}Bh$

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

$V = \frac{1}{3}(5m)(6m)(7m)$

$V = 70m^3$

Example 11:

Find the surface area.

12 m
6 m
12 m
12 m   10.38 m
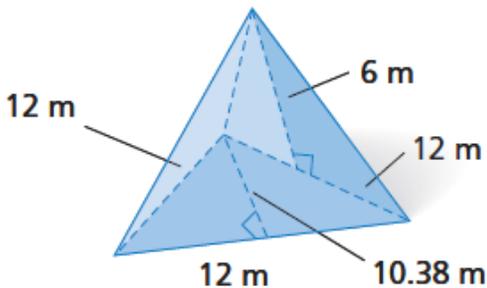
$SA = \frac{1}{2}Pl + B$

$SA = 0.5(12 + 12 + 12)(6) + 0.5(10.38)(12)$

$SA = 108 + 62.28$

$SA = 170.28 \ m^2$

Example 12:

Find the surface area. Use 3.14 for pi.

10 cm
3 cm
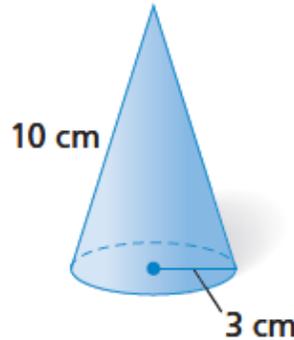
$SA = \frac{1}{2}(2\pi r)l + B$

$SA = \pi r l + \pi r^2$

$SA = (3.14)(3)(10) + 3.14(3)^2$

$SA = 94.2 + 28.26$

$SA = 122.46 \ cm^2$

Surface Area of Pyramids & Cones

<div style="border:1px solid black">

Formula(s)

Rectangular & Triangular Pyramids

$SA = \frac{1}{2}P\ell + B$

Cone

$SA = \frac{1}{2}(2\pi r)\ell + B$

P = Perimeter of Base
ℓ = slant height
B = Area of Base

</div>

Example 10:

Find the surface area.

5 in.

4 in.

4 in.
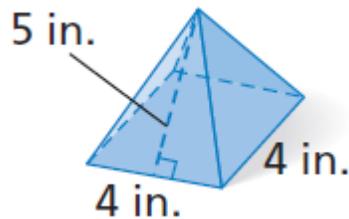
$SA = \frac{1}{2}P\ell + B$
$SA = 0.5(4+4+4+4)(5) + 4(4)$
$SA = 56\text{in}^2$

Example 5:

Find the volume.


8 in.
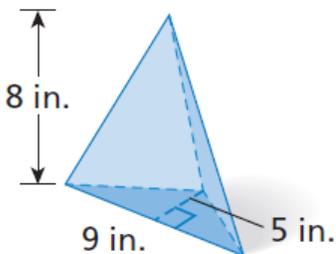
9 in.   5 in.

$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(\frac{1}{2}bh)h$

$V = \frac{1}{3}(\frac{1}{2})(9\text{in})(5\text{in})(8\text{in})$

$V = 60\text{in}^3$

Example 6:

Find the volume. Use 3.14 for pi.

4.2 yd

8 yd
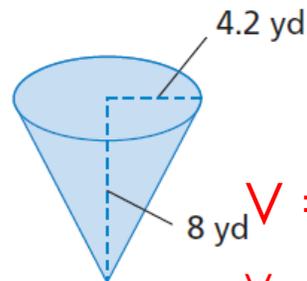
$V = \frac{1}{3}Bh$

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

$V = \frac{1}{3}(3.14)(4.2\text{in})^2(8\text{in})$

$V = 147.7\text{yd}^3$

Volume of Pyramids & Cones

Formula(s)

Rectangular Prism
SA = 2bh + 2bw + 2hw

Triangular Prism
SA = Ph + 2B

Cylinder
SA = $2\pi r^2 + 2\pi rh$

Example 7:

Find the surface area.

4 in.
2 in.
3 in.
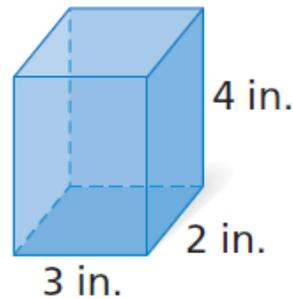
SA = 2bh + 2bw + 2hw
SA = 2(3)(4) + 2(3)(2) + 2(4)(2)
SA = 24 + 12 +16
SA = 52 in²

Example 8:

Find the surface area.

14.9 mm
8 mm
20 mm
10 mm
12 mm
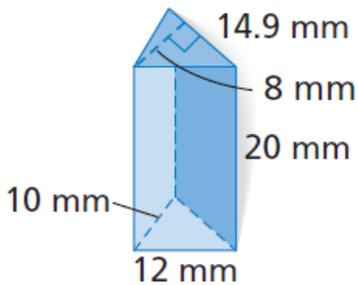
SA = Ph + 2B

SA = (10+12+14.9)(20) + 2($\frac{1}{2}$)(14.9)(8)

SA = 738 + 119.2

SA = 857.2 mm²

Example 9:

Find the surface area. Use 3.14 for pi.

3 cm
4 cm
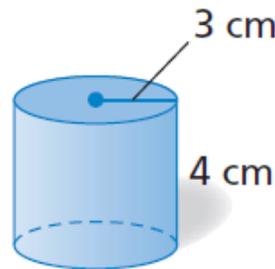
SA = $2\pi r^2 + 2\pi rh$

SA = 2(3.14)(3)² + 2(3.14)(3)(4)
SA = 56.52 + 75.36
SA = 131.88 cm²

# Surface Area of Prisms & Cylinders

Directions:
Step 1: Print pages 1&2, 3&4, 5&6 front to back so that the print is facing in opposite directions.

Step 2: Line up the pages as shown below.

Surface Area of Prisms & Cylinders
Surface Area of Pyramids & Cones
Measurement in 3-D Figures
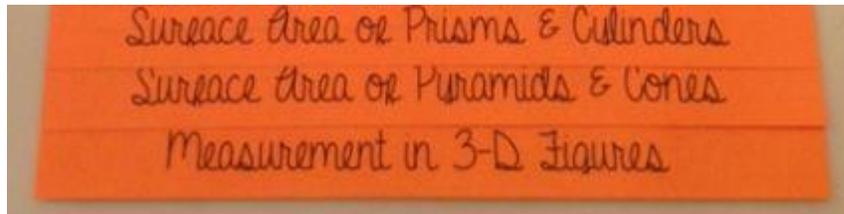
Step 3: Fold over the top half and secure with staples.

The final product should look like this:

3-D Geometry
(Volume & Surface Area)

Volume of Prisms & Cylinders
Volume of Pyramids & Cones
Surface Area of Prisms & Cylinders
Surface Area of Pyramids & Cones
Measurement in 3-D Figures