VOLUME AND TOTAL SURFACE AREA OF PRISMS & CYLINDERS

TSA is the Total surface Area of a three dimensional object and is found by the sum of all of the areas of faces, or sides, of the figure. (2 dimensional)

Use 4 steps for "area sub-problems":
1. Picture Equation
2. Formulas
3. Simplify
4. Answer (exact and approximate)

This will help to justify your work and communicate your strategy clearly.

For any figure that has two congruent, parallel bases (that is, the figure could be formed by stacking many thin "slices" of the exact same shape all the way through):

Volume (3 dimensional)

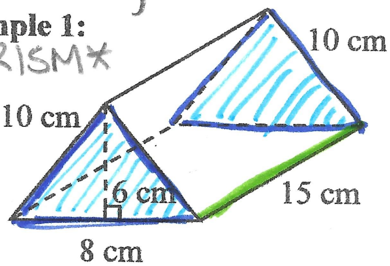
V = (Base Area) • Height

*HEIGHT is ALWAYS PERPENDICULAR distance from base to point furthest away.

**NOTE: The base is NOT always located on the "bottom" of prisms!!!*

In figures that can be dissected this way, the two bases are connected by rectangles: parallelograms, rhombi, *or* squares.

Example 1:
PRISM



V = △ • 15

$= (\frac{1}{2} 6 \cdot 8) \cdot 15$

$= 24 \cdot 15$

$V = 360\ cm^3$

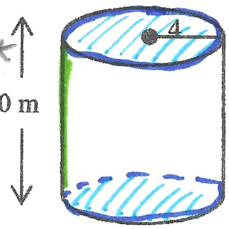
TSA = 2(△) + 2(10 ▭ 15) + 8 ▭ 15

$= 2(\frac{1}{2} 6 \cdot 8) + 2(10 \cdot 15) + (8 \cdot 15)$

$= 48 + 300 + 120$

$TSA = 468\ cm^2$

Example 2:
CYLINDER



V = ◯ • 10

$= (\pi \cdot 4^2) \cdot 10$

$= 16\pi \cdot 10$

$V = 160\pi\ m^3$ exact OR $V \approx 502.65\ m^3$ (approximate)

TSA = 2(◯) + 10 ▭ $2\pi \cdot 4$ *circumference of circle!

$= 2(\pi \cdot 4^2) + (10 \cdot 8\pi)$

$= 32\pi + 80\pi$

$TSA = 112\pi\ m^2$ OR $TSA \approx 351.86\ m^2$