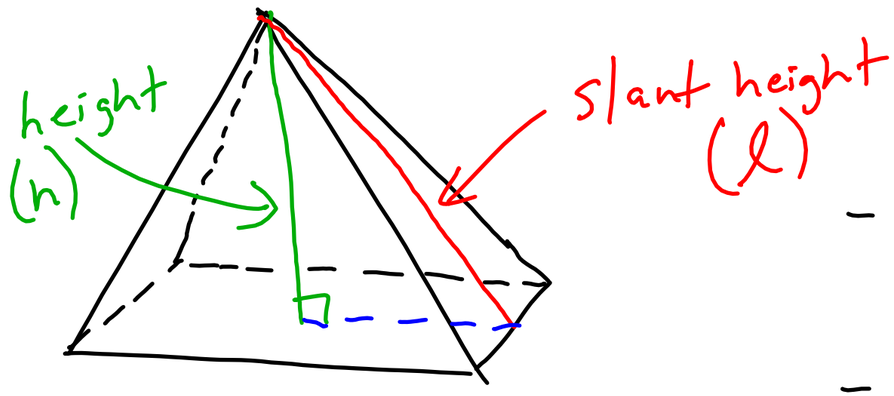
Surface Area / Volume of Pyramids / Cones

- Pyramids → lateral faces are triangles

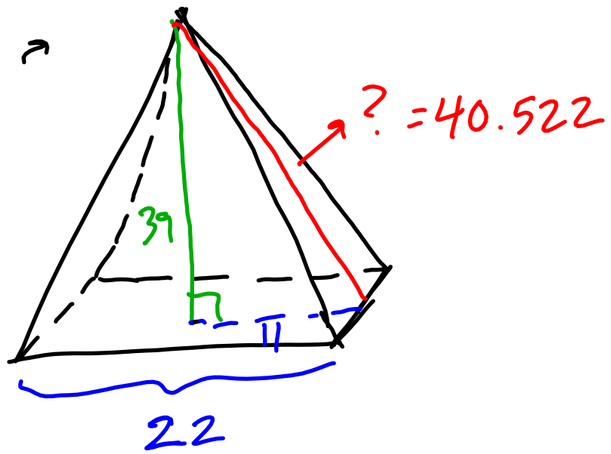


→ defined by shape of base

EX → rectangular pyramid

- Lateral Area $= \frac{1}{2} \cdot$ Perimeter of Base $\cdot$ Slant Height
  $= \frac{1}{2} \cdot P \cdot \ell$
- Surface Area = Lateral Area + Area of Base
  $= LA + B$
- Volume $= \frac{1}{3} \cdot$ Area of Base $\cdot$ Height $= \frac{1}{3} \cdot B \cdot h$

EX →



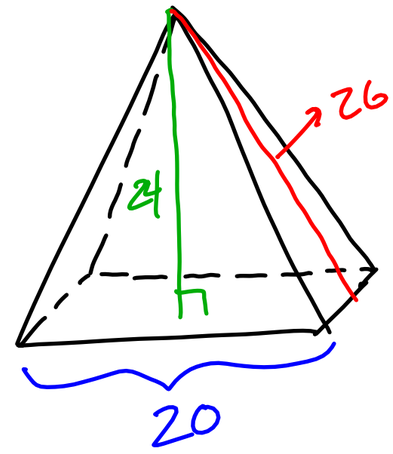
$\ell = \sqrt{11^2 + 39^2} = 40.522$

$LA = \frac{1}{2}(22 \cdot 4)(40.522) = 1782.97$

$SA = 1782.97 + (22 \cdot 22) = 2266.97$

$V = \frac{1}{3}(22 \cdot 22)(39) = 6292$

EX →

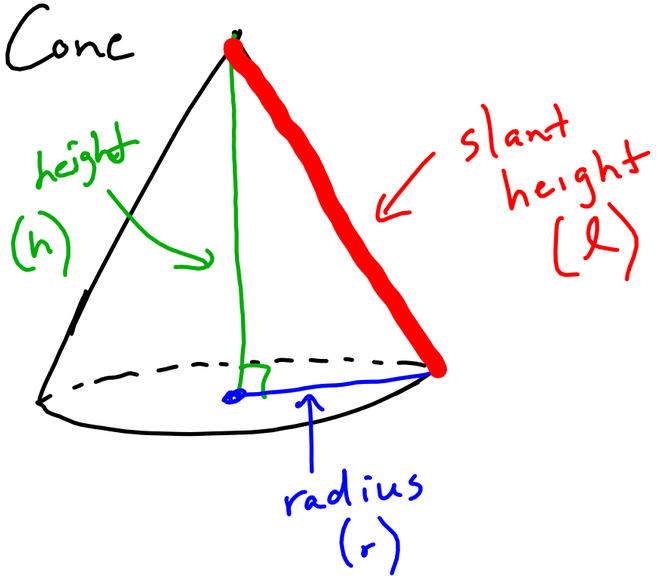


$LA = \frac{1}{2}(20 \cdot 4)(26) = 1040$

$SA = 1040 + (20 \cdot 20) = 1440$

$V = \frac{1}{3}(20 \cdot 20)(24) = 3200$

Cone



$\rightarrow$ Lateral Area $= \frac{1}{2} \cdot \overbrace{\text{Perimeter of Base}}^{\text{Circumference}} \cdot \text{Slant Height}$

$= \frac{1}{2} \cdot \pi \cdot d \cdot l = \pi \cdot r \cdot l$

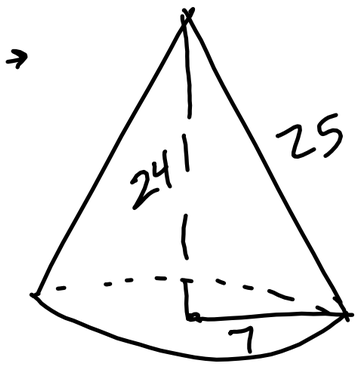
$\rightarrow$ Surface Area = Lateral Area + Area of Base

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

$\rightarrow$ Volume $= \frac{1}{3} \cdot$ Area of Base $\cdot$ Height

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

EX $\rightarrow$



$LA = \pi(7)(25) = 175\pi$

$SA = 175\pi + \pi(7)^2 = 175\pi + 49\pi = 224\pi$

$V = \frac{1}{3}(7)^2\pi \cdot (24) = 392\pi$

HW: p. 713 → 9-23, 44

p. 729 → 5-16