

$$V = \frac{1}{2}(g+h)j \cdot k$$

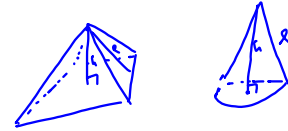
$$1020 = \frac{1}{2}(17+7)5 \cdot k$$

$$1020 = (12)5 \cdot k$$

$$\frac{1020}{60} = \frac{60 \cdot k}{60}$$

$$17 = k$$

### 9.7 Volumes of Pyramids and Cones



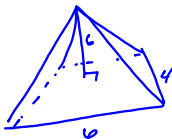
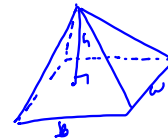
Volume of a pyramid

Volume of a Prism  
 $V = Bh$

Pyramid is  $\frac{1}{3}$  of a Prism  
 by Volume

Volume of Pyramid

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

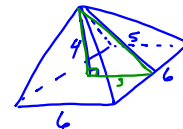


$$V = \frac{1}{3}Bh$$

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

$$V = \frac{1}{3}(24)6$$

$$V = 8 \cdot 4 = 48u^3$$



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

$$V = \frac{1}{3}(36)4$$

$$V = 12 \cdot 4 = 48u^3$$

Pythagorean

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


$$3^2 + b^2 = 5^2$$

$$9 + b^2 = 25$$

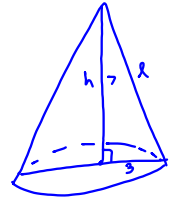
$$b^2 = 16$$

$$b = 4$$


Cone - Area of Base



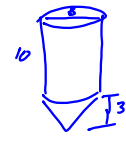
$V = \frac{1}{3} B h$   
 add circle for B  
 $V = \frac{1}{3} \pi r^2 h$



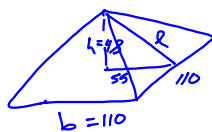
$\frac{1}{2} d = r$   $V = \frac{1}{3} \pi r^2 h$   
 $r^2 + h^2 = l^2$   
 Pythagorean Thm  
 $V = \frac{1}{3} \pi (3)^2 \cdot 7$   
 $V = \frac{1}{3} \pi \cdot 9 \cdot 7$   
 $V = 21\pi = 65.97 \mu^3$



$r = 5$   $V = \frac{1}{3} \pi r^2 h$   
 $r^2 + h^2 = l^2$   
 $5^2 + h^2 = 13^2$   $V = \frac{1}{3} \pi (5^2) 12$   
 $25 + h^2 = 169$   $V = \frac{1}{3} \pi \cdot 25 \cdot 12$   
 $h^2 = 144$   $V = 100\pi = 314 \mu^3$   
 $h = 12$



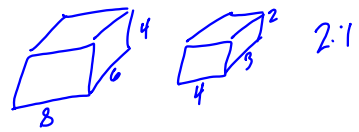
$r = 4$   
 $V_c = \pi r^2 h$   
 $V_c = \frac{1}{3} \pi r^2 h$   
 $V = \pi (4)^2 \cdot 10$   
 $V = 160\pi$   
 $V = \frac{1}{3} \pi (4)^2 \cdot 3$   
 $V = 16\pi$   
 $V = 176\pi = 552.6 \text{ mm}^3$



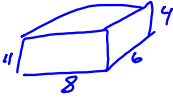
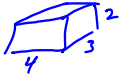
$b = 110$   
 $b^2 + h^2 = l^2$   
 $110^2 + 48^2 = 75^2$   
 $b^2 = 75^2 - 48^2$   
 $b = 55$   
 $V = \frac{1}{3} (110)(110)(48)$   
 $V = 193600 \text{ in}^3$

### 9.8 Similar Polygons

- Same Shape  
(Angles are congruent)
- Proportional sides  
Same size ratio



2:1

$V = 192:24$   
 $\Rightarrow 8:1$

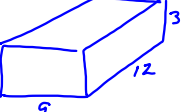
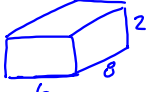
$2(8 \times 4) \quad 64$   
 $2(8 \times 6) \quad 96$   
 $2(6 \times 4) + 48$   
 $\hline 208$

$2(4 \times 2) \quad 16$   
 $2(4 \times 3) \quad 24$   
 $2(3 \times 2) \quad 12$   
 $\hline 52$

$V = 4 \cdot 6 \cdot 8 = 192$   
 $208:52$   
 $4:1$

$V = 2 \cdot 3 \cdot 4 = 24$

Side ratio  $2:1$   
 S.A ratio  $4:1$   
 Vol ratio  $8:1$

$3:2$

$2(9 \times 12) \quad 216$   
 $2(9 \times 3) \quad 54$   
 $2(3 \times 12) \quad 72$   
 $\hline 342$

$2(6 \times 8) \quad 96$   
 $2(8 \times 2) \quad 32$   
 $2(6 \times 2) \quad 24$   
 $\hline 152$

$V = 9 \times 12 \times 3 = 324$   
 $V = 6 \times 8 \times 2 = 96$

$324:96$   
 $54:16$   
 $27:8$

$342:152$   
 $171:76$   
 $9:4$

Side Ratio  $3:2$   
 SA Ratio  $9:4$   
 Vol Ratio  $27:8$

$3:2$   
 $3^2:2^2$   
 $3^3:2^3$

$2:1$   
 $4:1$   
 $8:1$   
 $2:1$   
 $2^2:1^2$   
 $2^3:1^3$

If a the side ratio is  
 $a:b$   
 then the area ratio is  
 $a^2:b^2$   
 then the volume ratio is  
 $a^3:b^3$