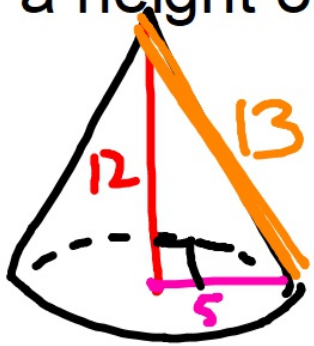
Good morning: warm up

Find the (exact) surface area of a cone with a height of 12 and volume 100π



$100\pi = \frac{1}{3}\pi r^2 (12)$

$100 = 4r^2$

$25 = r^2$

$5 = r$

$12^2 + 5^2 = c^2$

$13 = c$

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

$SA_{con} = \pi r l + \pi r^2$

$SA = \pi(5)(13) + \pi(5)^2$

$= 65\pi + 25\pi$

90π

Reminders:
test Thursday retakes in DS (ask for a pass)

visibly random grouping

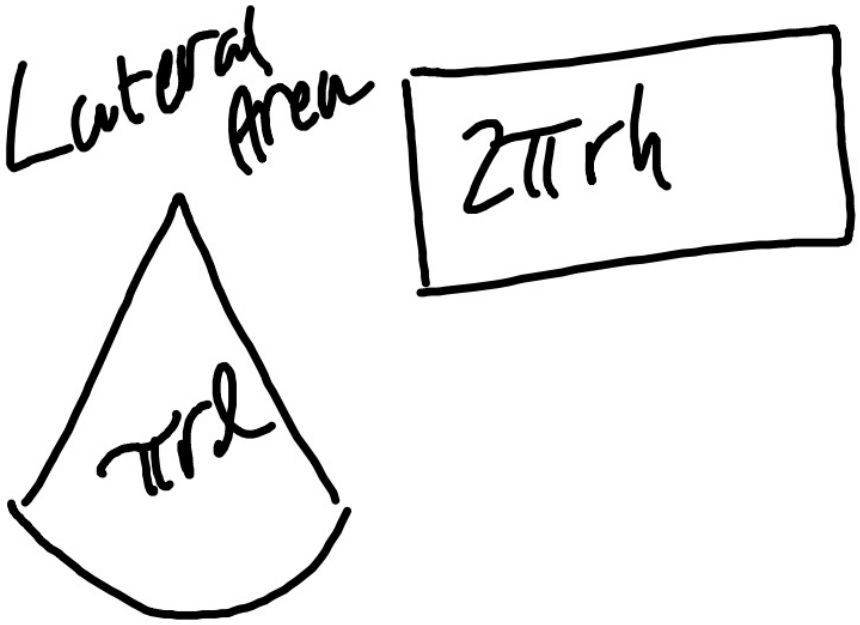
HW answers

505

3. 960π cm^2 (about 3016 cm^2)
8. 47.12cm^2
10. 6 m

521

3. LA 135π in^2, SA 216π in^2
4. a 50π cm^2 b75π cm^2
8. 66.667 in^3



What's on Thursday's Assessment:

GMD-A1a: explain 2 of the following formulas:
circle circumference, circle area, cylinder SA, cone SA

GMD-A1b: explain 2 of the following formulas:
prism, cylinder, cone, pyramid volume

GMD-A2: use volume/SA formulas to solve a problem

SRT-C7a: sine/cosine of complements

SRT-C8a: Applied SohCahToa trig (no law of sines/cosines needed

Brief Review of Formulas we covered:

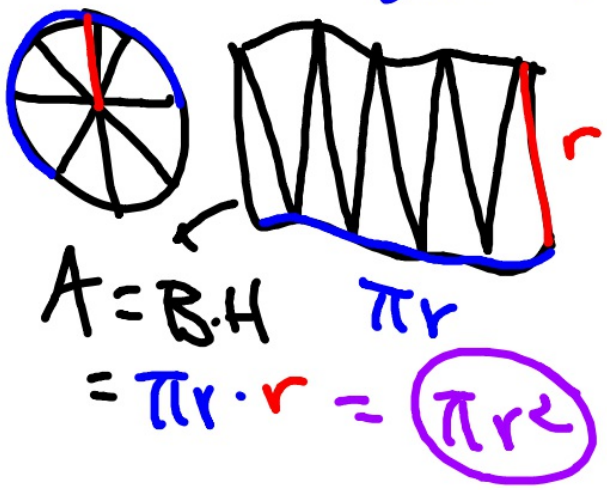
Circumference: $2\pi r$ must know the definition of π = $\frac{\text{Circumf.}}{\text{Diameter}}$

Circle Area: πr^2 'pizza slices, onion, octopus' method, use detailed diagrams and descriptions

Cylinder Volume: $\pi r^2 \cdot h$ stack of circles

Cylinder SA: $2\pi r^2 + 2\pi rh$ rolled up rectangle, width=circumference

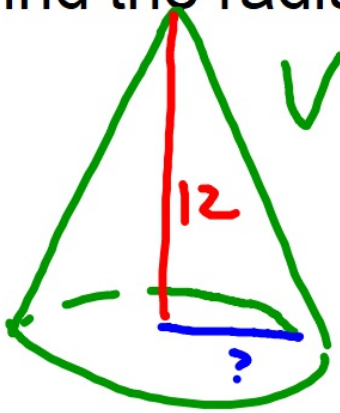
Cone Volume: $\frac{1}{3}\pi r^2 \cdot h$ video with 3 cones filling matching cylinder



Cone S.A. $\pi r^2 + \pi r l$

More review:

Find the radius of a 12" tall cone with a volume of 144π in^3.



$V = 144\pi = \frac{1}{3}\pi r^2 h$

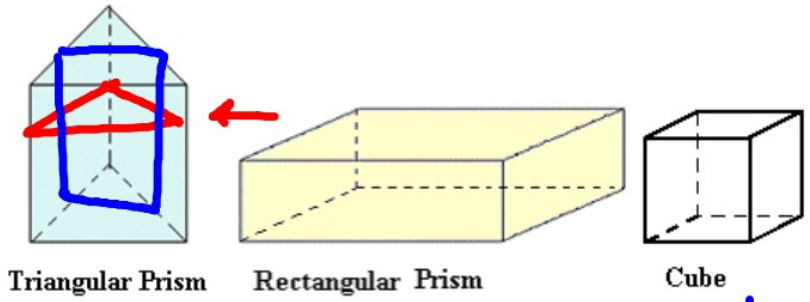
$144 = \frac{1}{3} r^2 \cdot 12$

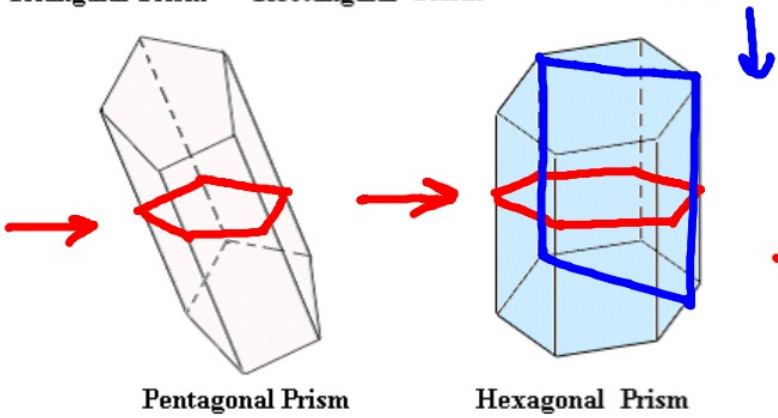
$144 = 4r^2$

$36 = r^2$

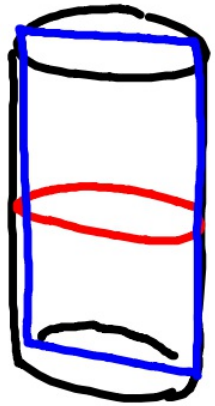
$6 = r$

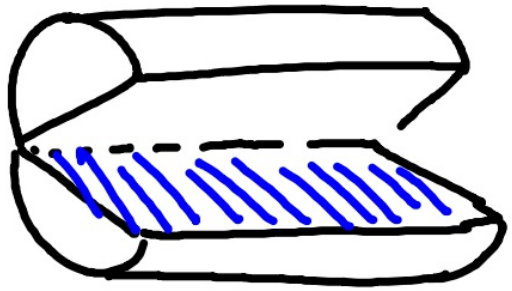
What are prisms?





-an extrusion of a flat shape
-rectangular cross sections
-base shape cross sections

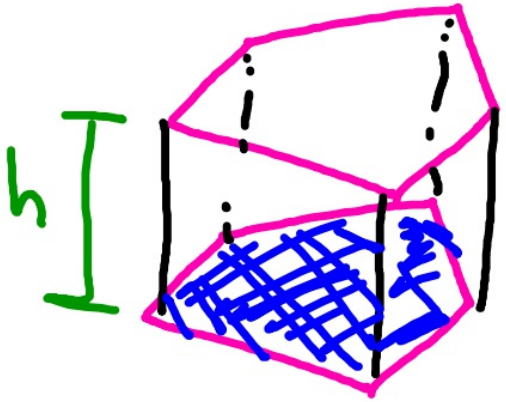




Prism Volume

$V = Bh$

B is base area



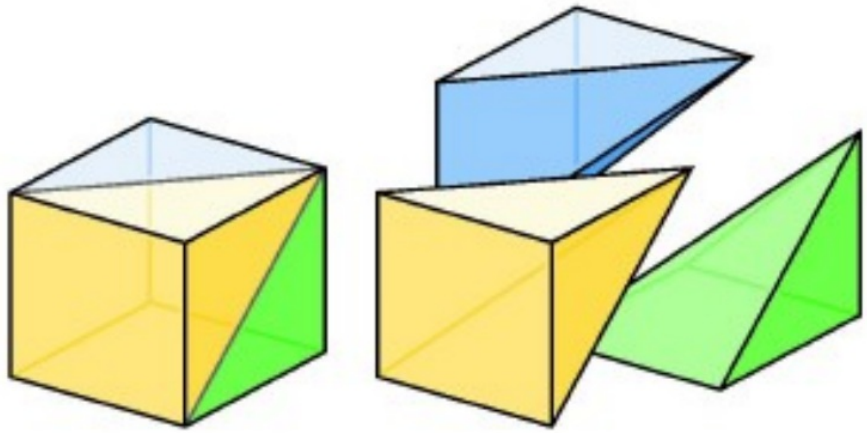
A prism is just a stack of
thin base-shape cross sections

ex: a cylinder is just a circle prism

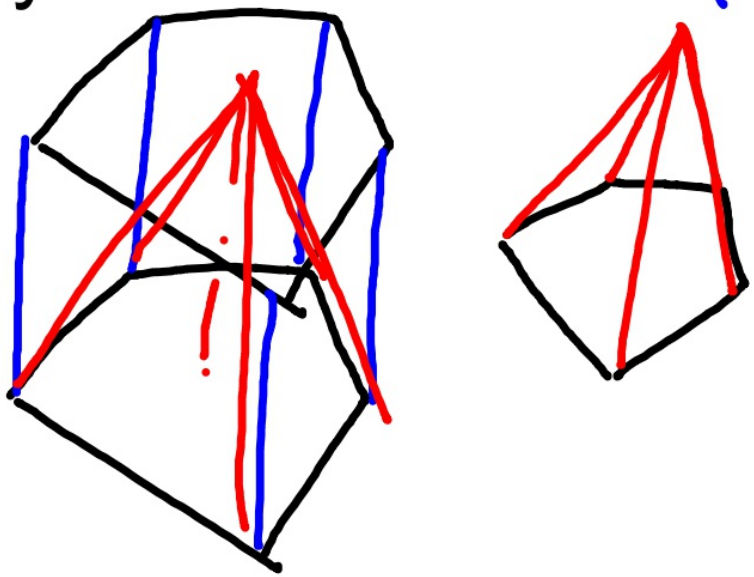
[redacted]

Rectangular Prism volume is very familiar: V=lwh

But what about pyramids?



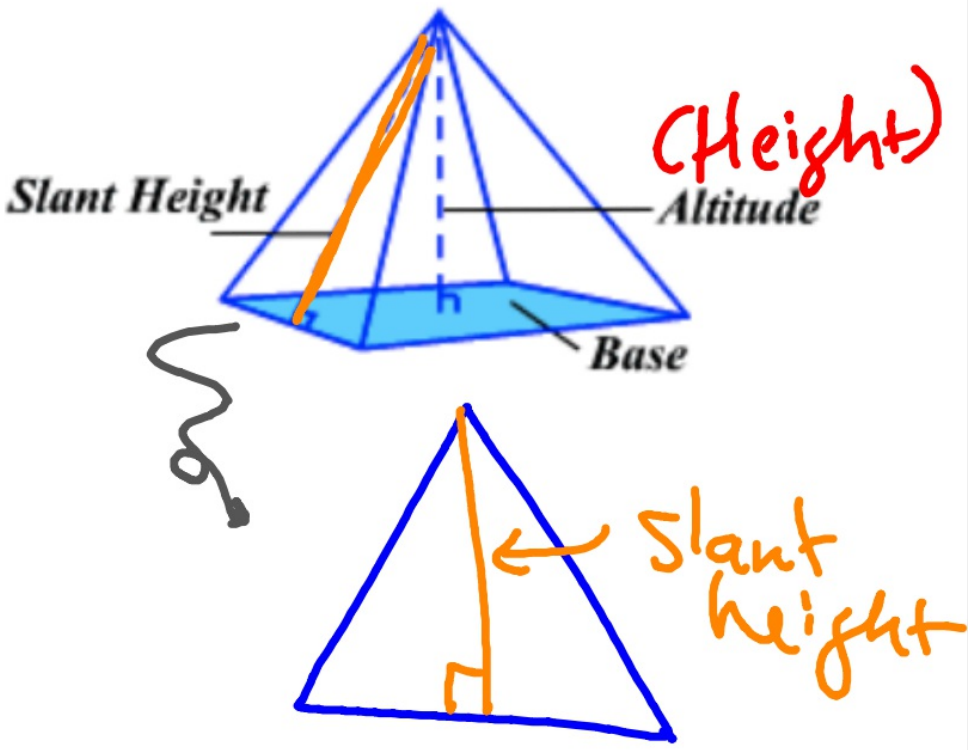
Cylinder: Cone :: Prism : Pyramid



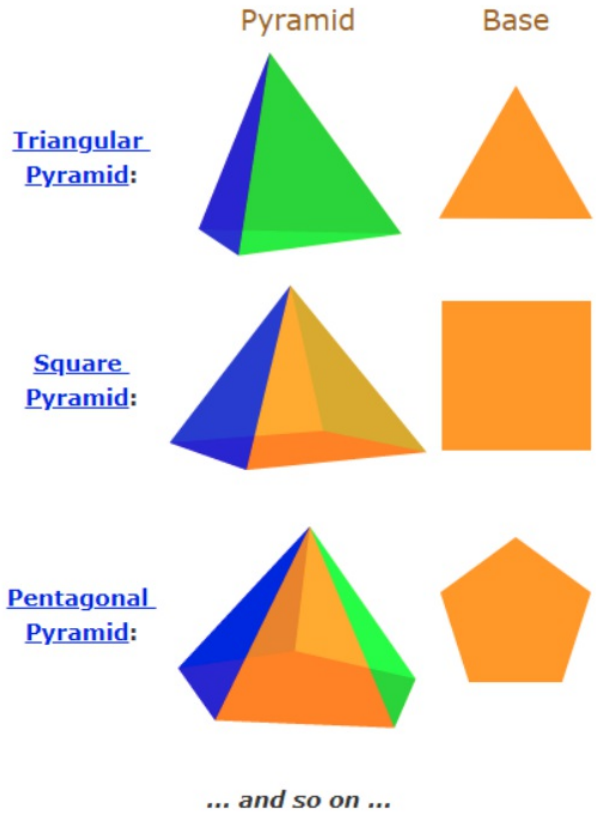
$$V_{PYR} = \frac{1}{3} B \cdot h$$

Prism

takes 3 to fill Prism

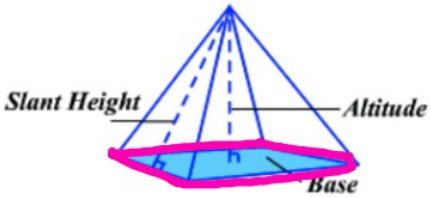


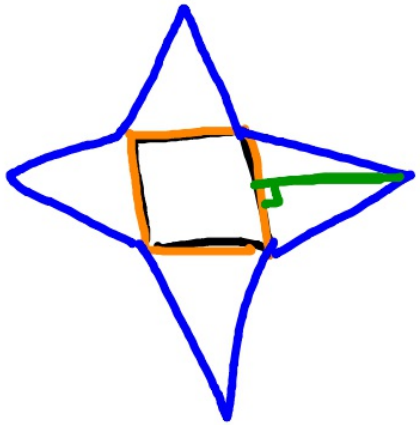
Any polygon can generate a prism or pyramid



Pyramid Surface Area

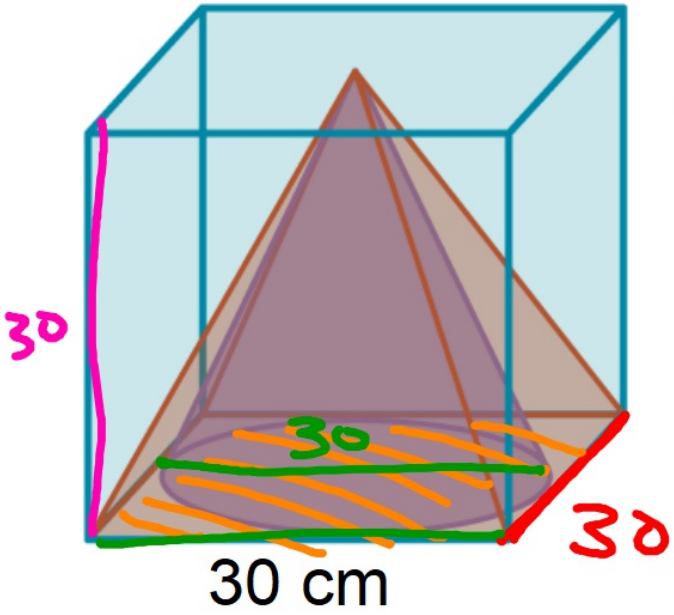
SA = base area + lateral area





lateral area: ½(slant)(base perimeter)

[redacted]



Cube with a nested pyramid and cone
Find the volume of all 3 figures
(2 dec.)

Cube: $V = B \cdot h$

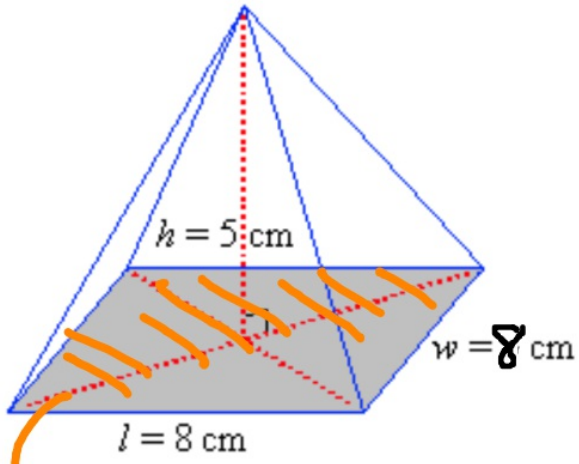
$(900)(30) = 27{,}000$ cm³

Pyr: $\frac{1}{3} B \cdot h = 9{,}000$ cm³

Cone: $\frac{1}{3}\pi(15)^2 \cdot 30$

$10\pi \cdot 15^2 = 2250\pi \approx 7068.58$ cm³

Find the volume of this pyramid



$B = 64 \text{ cm}^2$

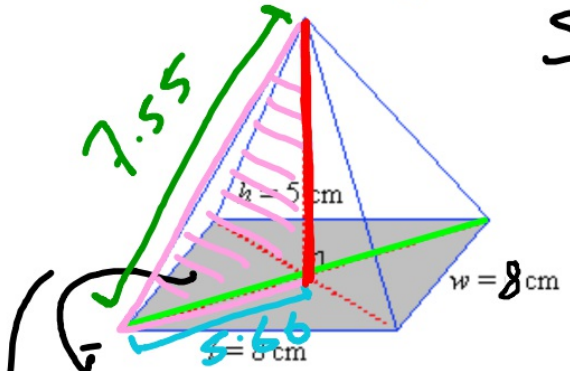
$V = \frac{1}{3} B \cdot h$

$= \frac{1}{3}(64)(5)$

$\approx 106.7 \text{ cm}^3$

Now find its surface area

HINT: find the length of the green line



$SA = B + LA$

$64 + \frac{1}{2}(\text{slant})(\text{base Perim})$

32

② 5 $5.66^2 + 5^2 = c^2$

$7.55 = c$

① 11.31, 8, 8 $8^2 + 8^2 = c^2$

$11.31 = c^2$

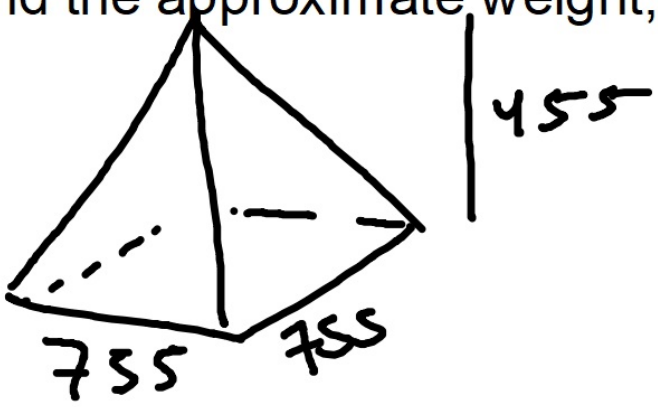
③ 7.55, slant, 4, 8 $4^2 + l^2 = 7.55^2$

$l = 6.40$

$SA = 64 + \frac{1}{2}(6.40)(32)$

$\approx 166.4 \text{ cm}^2$

The Great Pyramid of Giza is a square pyramid with a base 755 feet long. It is 455 feet tall. If a cubic foot of limestone weighs 160 lbs, find the approximate weight, in tons, of the Pyramid. (1 ton = 2000lbs)



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

$V = \frac{1}{3}(755)(755)(455)$

$V = 86{,}45{,}379.67$ ft^3

$\times$ 160 lbs/ft3

1.38×10^{10} lbs

$\div$ 2000 lbs/ton

6,916,303 tons

Practice Assessment

HW
finish the practice assessment, check solutions, review videos to help study for Thursday's test: mgeo.weebly.com