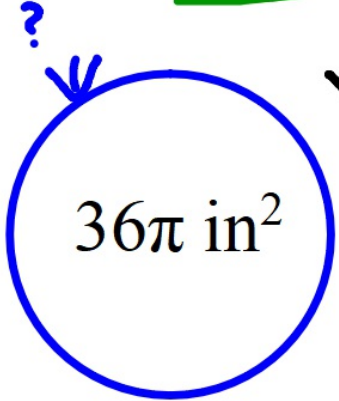


Good morning: warm up

Find the circumference of a circle with area $36\pi \text{ in}^2$.

①  $36\pi \text{ in}^2$

$A = \pi r^2$
 $36\pi = \pi r^2 \rightarrow 36 = r^2 \Rightarrow 6 = r$

$C = 2\pi r \rightarrow 12\pi \approx 37.7 \text{ in}$

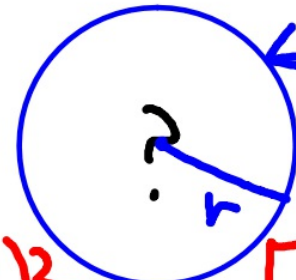
$C = 2\pi r$
 $A = \pi r^2$

exact answer

② Find the area of a circle with circumference $18\pi \text{ cm}$.

$\frac{18\pi}{2\pi} = \frac{2\pi r}{2\pi}$
 $9 = r$

$\pi(9)^2$

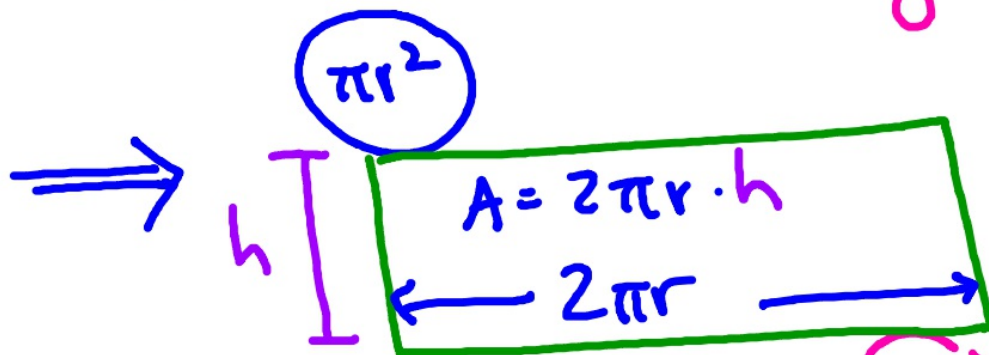
 $18\pi \text{ cm}$

$81\pi \text{ cm}^2$

Next Test:
uh... TUESDAY

How do you make a cylinder?

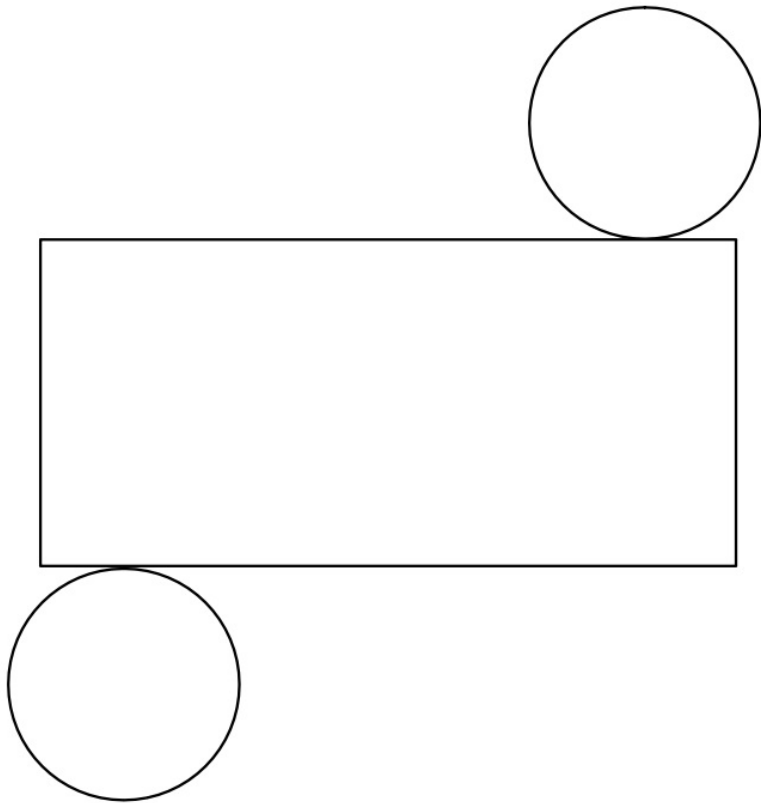
- a stack of circles (V)
- a rolled up rectangle (S.A.)



S.A.
↙

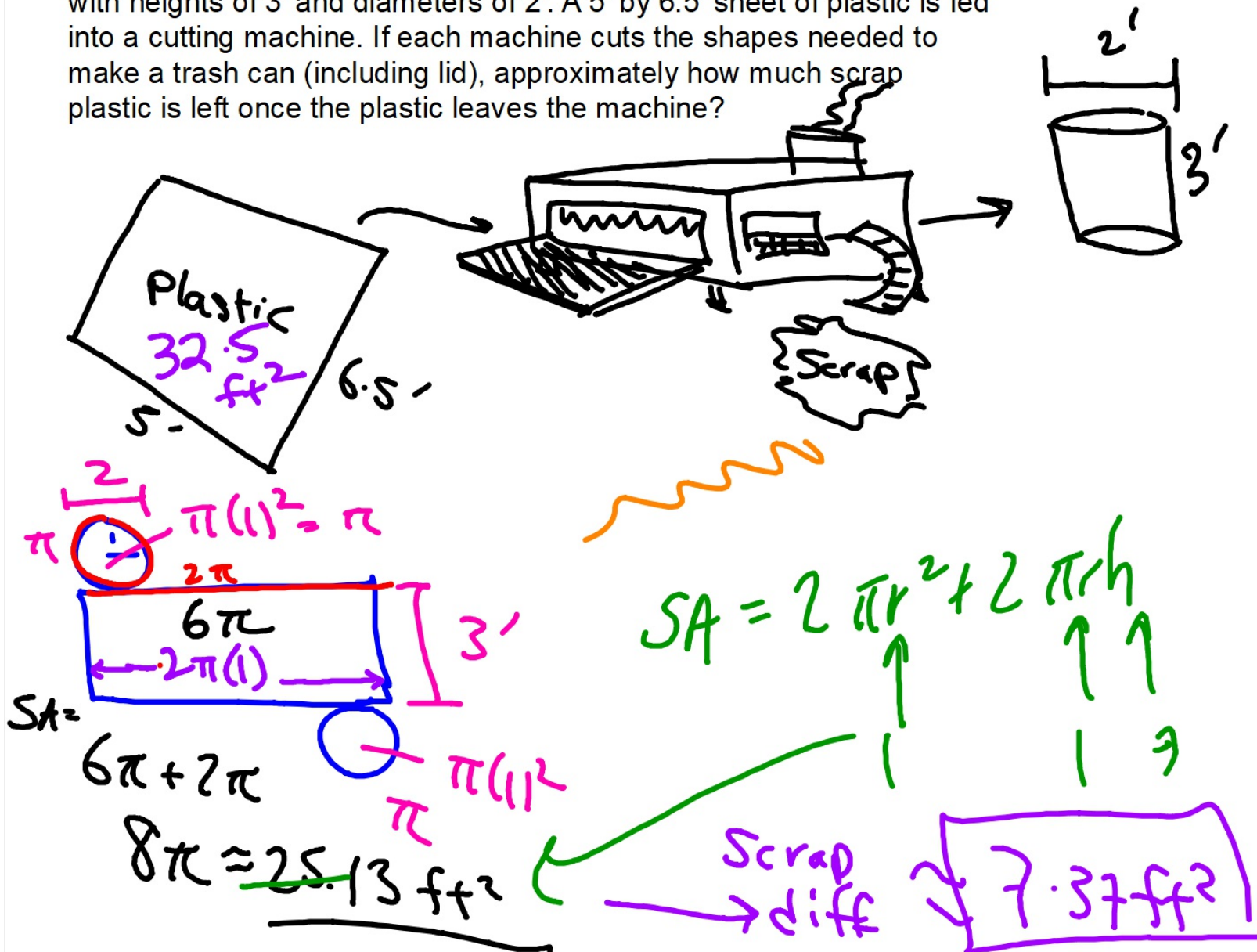
$$SA_{\text{cyl}} = \underbrace{2\pi r^2}_{\text{circles}} + \underbrace{2\pi r h}_{\text{rectangle}}$$

Cylinder Surface Area Formula: $SA = 2\pi r^2 + 2\pi rh$



$\approx 7.37 \text{ ft}^2$

Literally Me™ trash company produces plastic cylindrical trashcans with heights of 3' and diameters of 2'. A 5' by 6.5' sheet of plastic is fed into a cutting machine. If each machine cuts the shapes needed to make a trash can (including lid), approximately how much scrap plastic is left once the plastic leaves the machine?



Find the surface area of a cylinder with height 12 and volume 108π .

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

$$V = \pi r^2 \cdot h$$

$$108\pi = \pi \cdot r^2 \cdot 12$$

$$108 = 12r^2 \rightarrow \div 12 \rightarrow 9 = r^2 \rightarrow \underline{\underline{r=3}} \quad \square$$

$$\begin{aligned} SA &= 2\pi(3) \cdot 12 + 2\pi(3)^2 \\ &= 72\pi + 18\pi \rightarrow 90\pi \end{aligned}$$

Circle circumference ✓ $2\pi r$

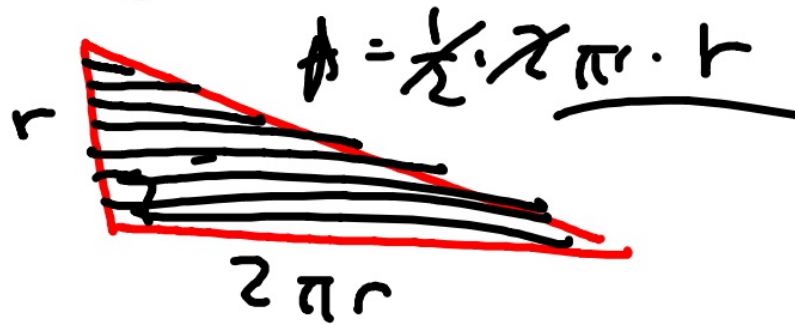
Circle area ✓ πr^2

Cylinder volume ✓ $\pi r^2 h$

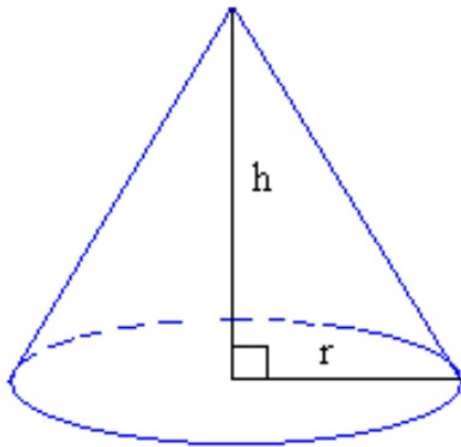
Cylinder surface area ✓ $2\pi r^2 + 2\pi r h$

Cone volume

Cone surface area



What is the formula for cone volume?

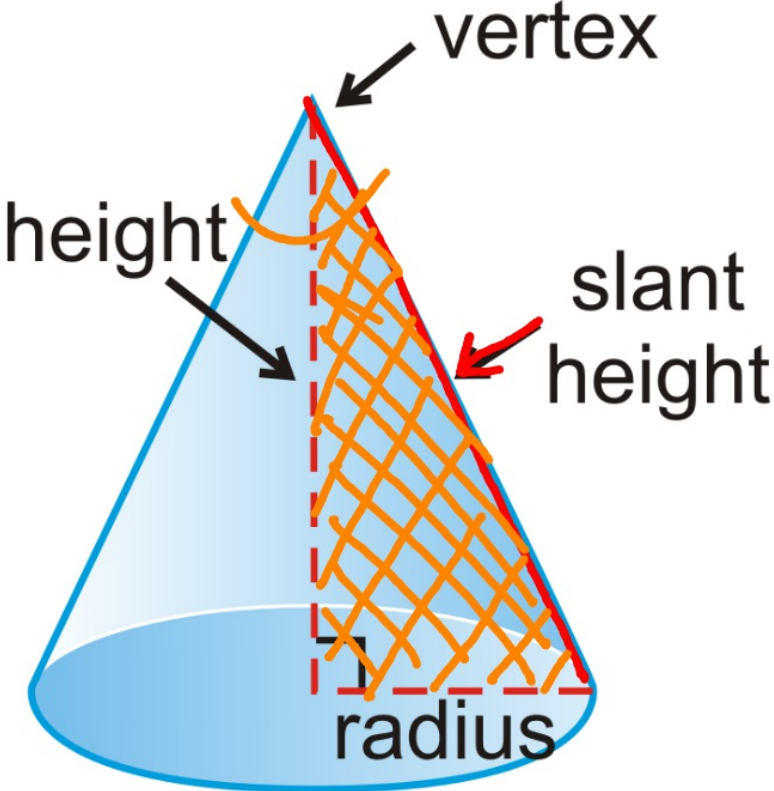


$$V = \frac{1}{3} \pi r^2 h$$

But why???

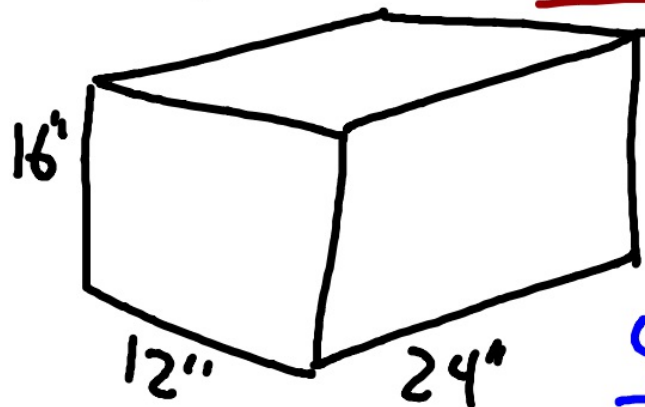


Parts of the cone



An ice box has dimensions $12 \times 24 \times 16$ inches. It is full of shaved ice for snow cones. Each paper cone cup has a radius of 1.5 inches and a height of 5 inches. Assuming the ice does not melt and that each cup is filled completely, about how many cups can be filled?

$$V = l \cdot w \cdot h = \underline{4608 \text{ in}^3}$$

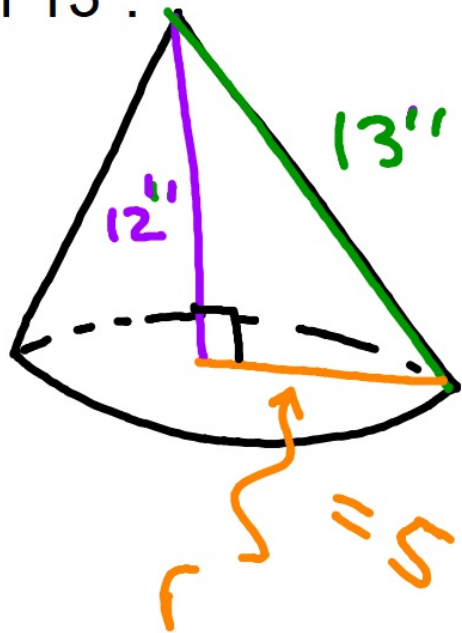


$$\begin{array}{r} 4608 \\ \underline{11.781} \\ \approx 391 \end{array}$$

$$\begin{aligned} V_{\text{cone}} &= \frac{1}{3} \pi r^2 h \\ &= \frac{1}{3} \pi (1.5)^2 \cdot 5 \\ &\approx \underline{11.781 \text{ in}^3} \end{aligned}$$

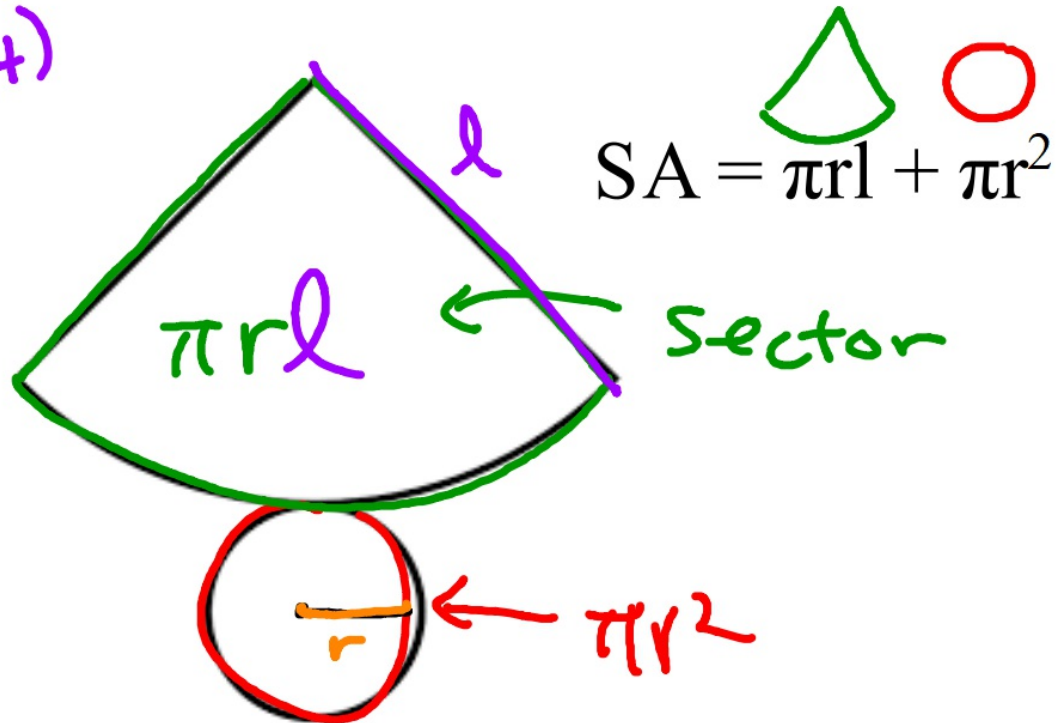
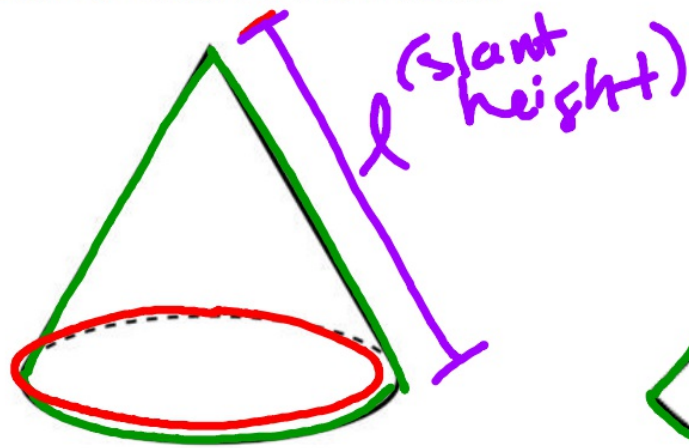
391

Find the volume of a cone with a height of 12" and a slant height of 13".

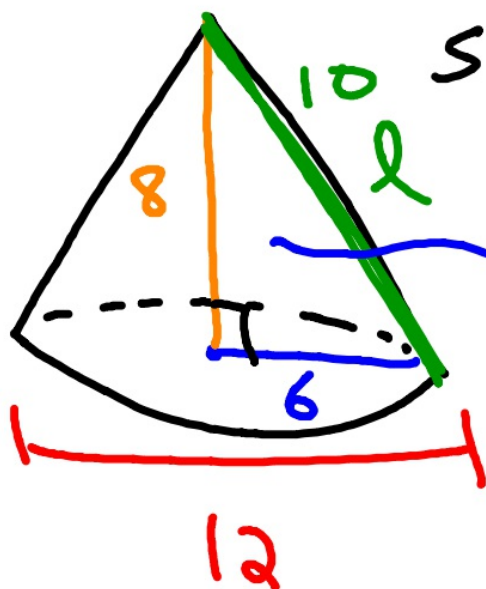


$$V = \frac{1}{3} \pi r^2 \cdot h$$
$$V = \left(\frac{1}{3}\right) \pi \cdot (5)^2 \cdot (12)$$
$$100\pi \text{ in}^3$$

Cone Surface Area



Find the total surface area of a cone with height 8 and base diameter 12.



$$SA = \pi r l + \pi r^2 \rightarrow \pi \cdot 6^2 \cdot 10 + \pi 6^2$$

$$6^2 + 8^2 = c^2$$
$$100 = c^2$$
$$10 = c$$

$$= 360\pi + 36\pi$$

$$396\pi$$

HW

p 505 #3,8,10

p 521 #3,4,8

"lateral area"
→ ignore the
base(s).

next test Tuesday

some trig, some area/volume