Good afternoon: no warm up

Assessments are being returned

HW for retakes:
GMD-A1a: p 475: #1-6,11
GMD-A1b: p 505: 3,8,10 AND p 521 #3,4,8
GMD-A2a: same as above

SRT-C7a: either practice test with this skill
SRT-C8a: video notes on applied trig

11:00- 11:55 – 1st block

12:00- 12:30 – MS Lunch/ HS DS

12:30- 1:00 – HS Lunch/ MS DS

1:05-2:00- 2nd block

2:05- 3:00- 3rd block

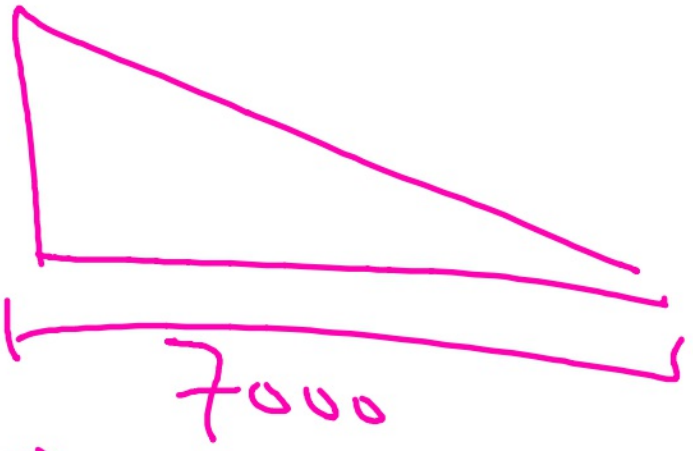
3:05-4:00- 4th block

Common Mistakes

$$\frac{\tan 31^\circ}{1} = \frac{4200}{x}$$

$$x \cdot \tan 31 = 4200$$

$$x = \frac{4200}{\tan 31} \approx 7000$$



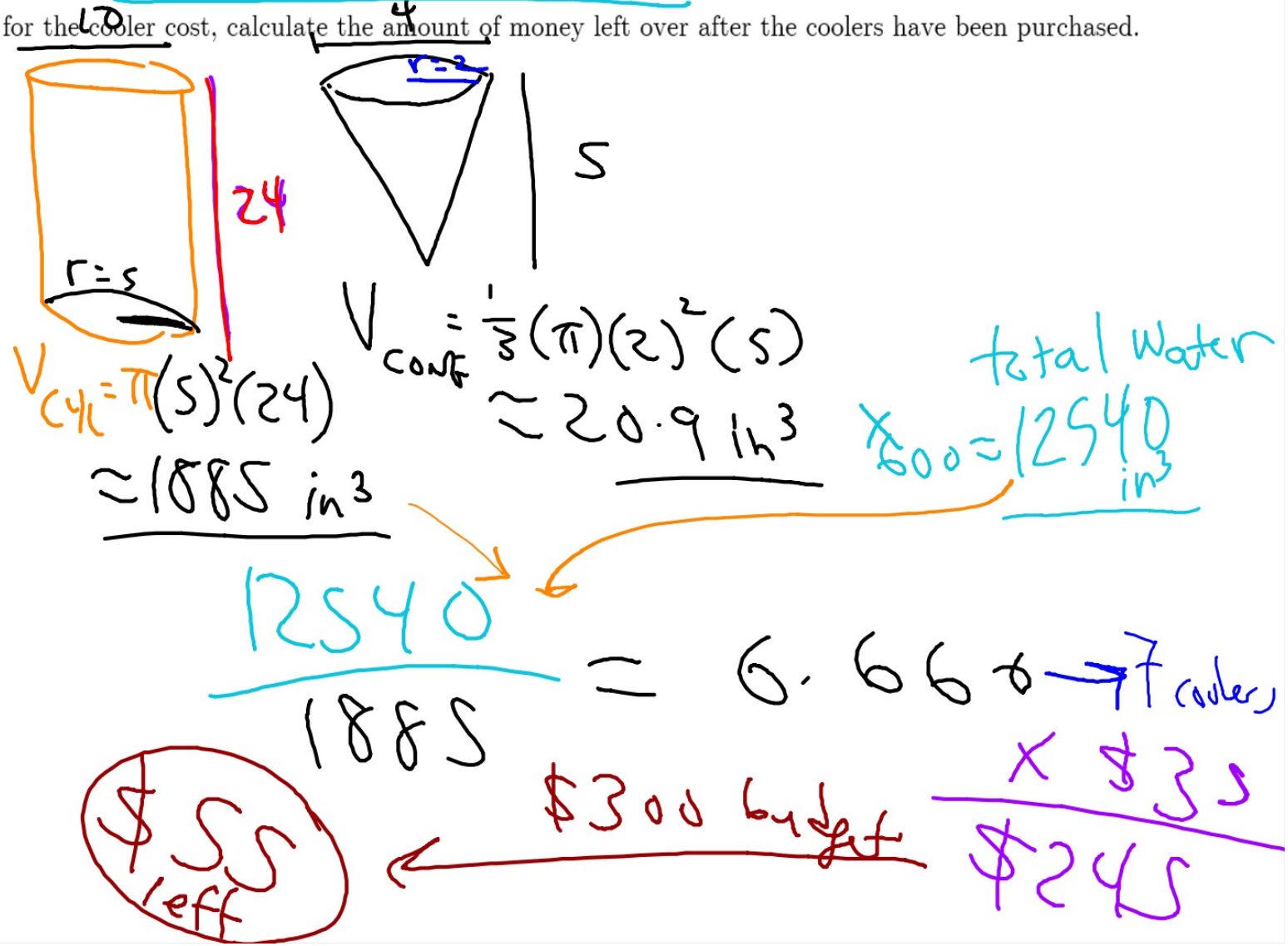
Circle circumference ✅
Circle area ✅
Cylinder volume ✅
Cylinder surface area ✅
Cone volume ✅
Cone surface area ✅
Pyramid volume ✅
Prism volume ✅
Pyramid surface area ✅
Sphere volume
Sphere surface area
Density

tested

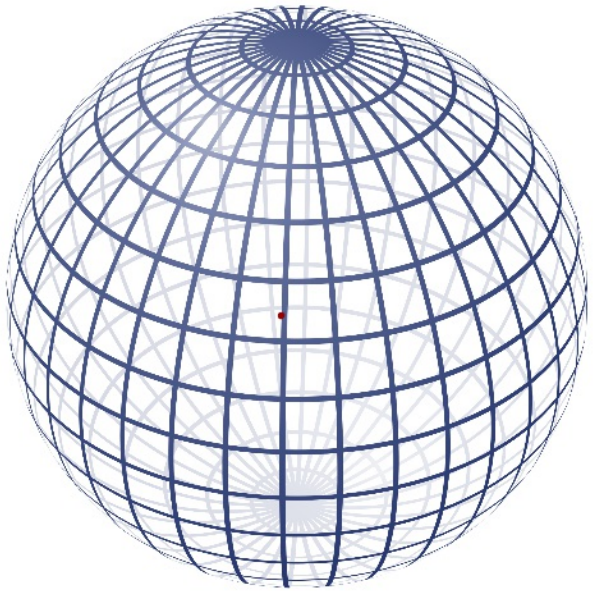
not yet tested

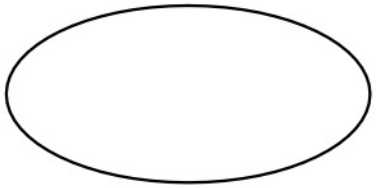
Extending what we've already learned

Organizers are preparing water for an upcoming race. Each water cooler is a 2-foot tall cylinder with a 10-inch diameter. Water is distributed in cone-shaped cups 5 inches tall with a diameter of 4 inches. There are 300 runners and each runner is given 2 drinks. If each cooler costs \$35 and \$300 is budgeted for the cooler cost, calculate the amount of money left over after the coolers have been purchased.



Spheres!





Sphere Volume

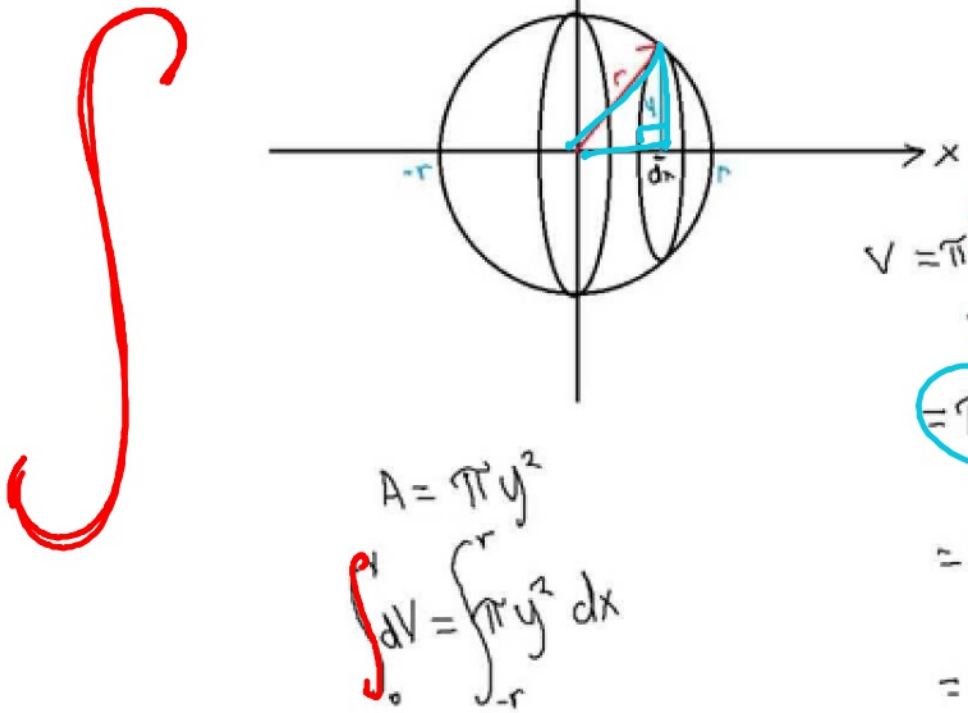
$$V = \frac{4}{3}\pi r^3$$

Sphere Surface Area

$$SA = 4\pi r^2$$

Why do these formulas work?

Uh...calculus



$$y^2 + x^2 = r^2$$

$$y^2 = r^2 - x^2$$

$$V = \pi \int_{-r}^{r} (r^2 - x^2)\,dx$$

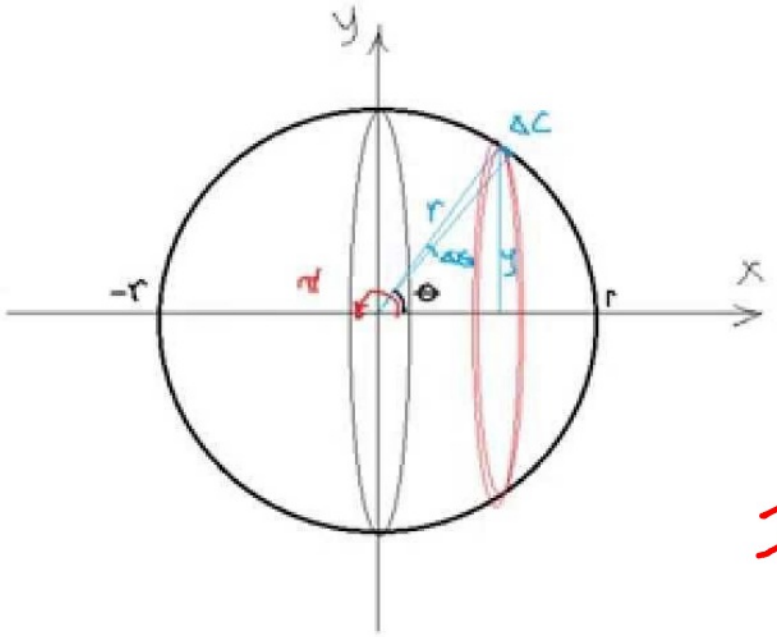
$$= \pi \left(r^2 x - \frac{x^3}{3} \right)_{-r}^{r}$$

$$= \pi \left[\left(r^2(r) - \frac{r^3}{3} \right) - \left(r^2(-r) - \frac{(-r)^3}{3} \right) \right]$$

$$= \pi \left[r^3 - \frac{r^3}{3} \right] -$$

$$A = \pi y^2$$

$$\int_0^V dV = \int_{-r}^{r} \pi y^2\,dx$$



$C = 2\pi y \qquad y = r\sin\theta$

$= 2\pi r\sin\theta$

$\Delta A = 2\pi r\sin\theta\,\Delta C$

$\Delta C = r\,\Delta\theta$

$$A = \int_0^{\pi} 2\pi r\sin\theta \cdot r\,d\theta$$

$$= 2\pi r^2 \Big|_0^{\pi} (-\cos\theta)$$

$$= 2\pi r^2 (1+1)$$

$$= (2\pi r^2)(2)$$

$$A = 4\pi r^2$$

Find the exact volume of a basketball with a 12 inch diameter.

$V = \frac{4}{3}\pi(6)^3$

216

$288\pi \text{ in}^3$

Now find its exact SA.

$SA = 4\pi r^2 = 4(\pi)(6)^2$

36

$144\pi \text{ in}^2$

Volume

250 mL of water are frozen into slush and reshaped into a spherical snowball. What is the approximate diameter of the snowball? (1 mL = 1cm^3)

$$V = \frac{4}{3}\pi r^3 = 250$$

$$\frac{\frac{4}{3}\pi r^3}{\pi} = \frac{250}{\pi}$$

$$\frac{3}{4}\left(\frac{4}{3}r^3 = 79.57\right)\frac{3}{4}$$

use cube root

$$\sqrt[3]{r^3} = \sqrt[3]{59.68}$$

$$r = 3.91 \text{ cm}$$

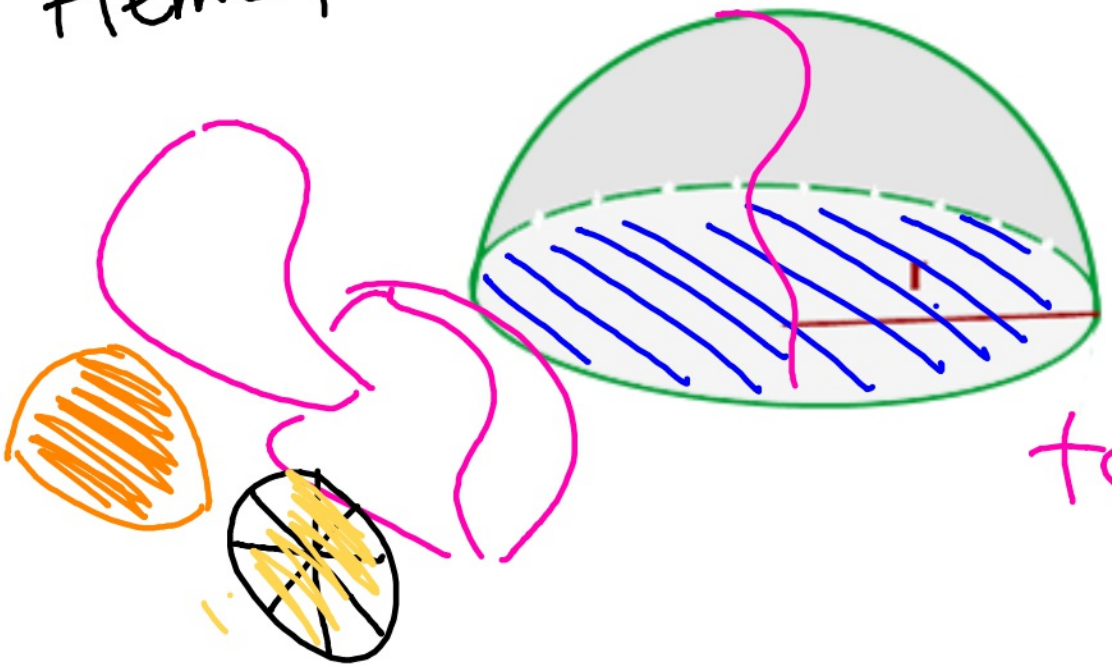
$$\frac{\frac{4}{3}r^3}{\frac{4}{3}} = \frac{79.5}{\frac{4}{3}}$$

$D = 7.82$ cm

What would the volume be for this?

What would the surface area be for this?

Hemisphere



$V_H = \frac{2}{3}\pi r^3$

$SA_H = 2\pi r^2$

total $SA = 3\pi r^2$

HW

p. 537: #3,6, 9, 11

~~p. 522: #11-13~~

study formulas: bit.ly/formulas18