Geometry/Trig

Name: KEY
Date: _____

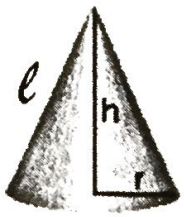
Lesson 2-3: Surface Area of Cones Practice

Learning Goals: #7: How do I find the surface area of Cones? **#8:** How do I find the lateral surface area of cones?

Surface Area of a Cone

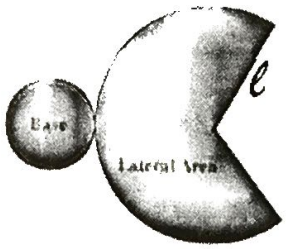
What area formula(s) do you think we will need to find the surface area of a cone?

Cone



h = height (altitude)
r = radius
ℓ = slant height

Net



Careful!
Sometimes we are asked to ***only find the lateral area*** instead of the ***total area!***

Total Surface Area of a Cone

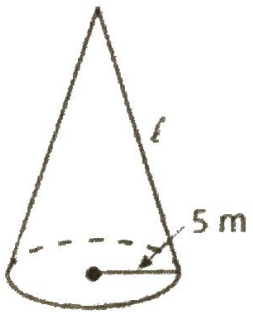
$$\text{Total SA} = \text{A(Circle)} + \text{A(curved/lateral)}$$

$$\text{Total SA} = \pi r^2 + \pi r l$$

$$\text{Lateral (Curved) SA} = \pi r l$$

Let's Look at a Different type of Question!

The surface area of the cone is 100π square meters. What is the slant height l of the cone?



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

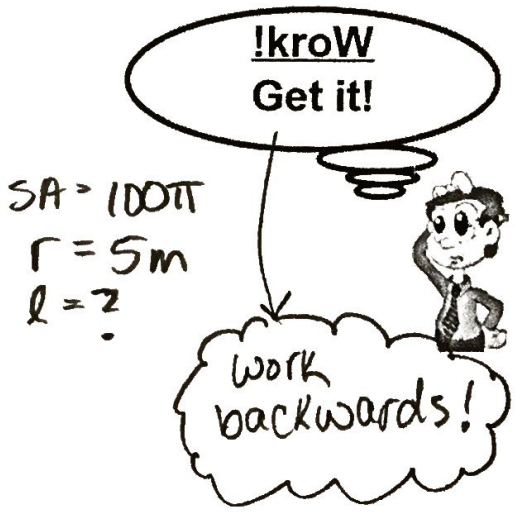
$100\pi = \pi(5)^2 + \pi(5)l$

$100\pi = 25\pi + 5\pi l$

$-25\pi \quad -25\pi$

$\frac{75\pi}{5\pi} = \frac{5\pi l}{5\pi}$

$l = 15\text{m}$



Geometry/Trig

Your Turn to Practice!

1. Find the **total surface area** of the given figure. Round to the nearest square unit.

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

$SA = \pi(20)^2 + \pi(20)(50)$

$SA = 400\pi + 1000\pi$

$SA = 1400\pi$

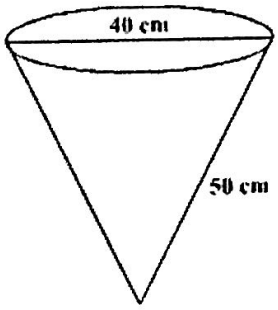
$SA = 4398.229715$

$\boxed{SA = 4398\ cm^2}$

$r = 20cm$

$l = 50cm$

$SA = ?$



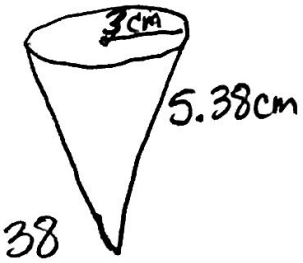
2. An ice cream cone has a radius of 3cm and a lateral height of 5.83cm. What is the ***lateral surface area*** of the cone?

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

$L.S.A. = \pi(3)(5.83)$

$\boxed{L.S.A. = 17.49\pi\ cm^2}$

Didn't specify what to round to so leave in terms of Pi



$r = 3$

$l = 5.38$

$L.S.A. = ?$

3. A geometric cone has a base with a radius of 15 cm, and a slant height of 20. Find, in terms of π, the number of square centimeters in the **total surface area** of the cone.

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

$SA = \pi(15)^2 + \pi(15)(20)$

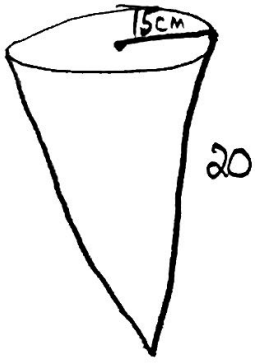
$SA = 225\pi + 300\pi$

$\boxed{SA = 525\pi\ cm^2}$

$r = 15cm$

$l = 20cm$

$SA = ?$

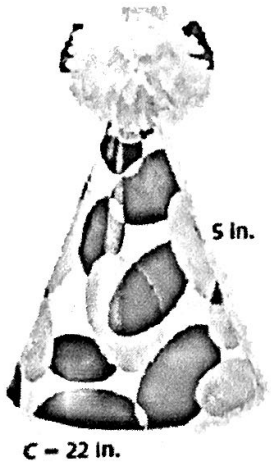


Geometry/Trig

Real Life Situations!

4. You design a party hat. You attach a piece of elastic along the diameter.

a) How long must the elastic be? (*Hint: find the diameter*)



$C = \pi d$

$\frac{22}{\pi} = \frac{\pi d}{\pi}$

$C = 22$ in

$d = ?$

$d = 7.002817496$ in.

Doesn't say to round so write the exact answer

b) How much paper do you need to make the hat, to the nearest square inch? (*Hint: find the lateral surface area*)

$L.S.A. = \pi r l$

$L.S.A. = \pi(3.5014087 48)(5)$

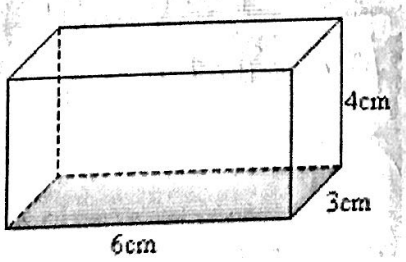
$L.S.A. = 55 in^2$

$d = \frac{7.002817496}{2}$

$r = 3,5014087 48$

$l = 5$ in

5. Calculate the surface area of the figure below.



$SA = 2lw + 2wh + 2hl$

$SA = 2(6)(3) + 2(3)(4) + 2(4)(6)$

$SA = 108 cm^2$

$l = 6$ cm

$w = 3$ cm

$h = 4$ cm

Geometry/Trig

4. A gift has the dimensions of **50 cm × 35 cm × 5 cm.** You have wrapping paper with dimensions of **75 cm × 60 cm.** Do you have enough wrapping paper to wrap the gift? ***Why or why not?***

① Surface Area of Gift

$SA = 2(L)(W) + 2(W)(H) + 2(H)(L)$

$SA = 2(50)(35) + 2(35)(5) + 2(5)(50)$

$SA = 3500 + 350 + 500$

$\boxed{SA = 4350 cm^2}$

② Area of wrapping Paper

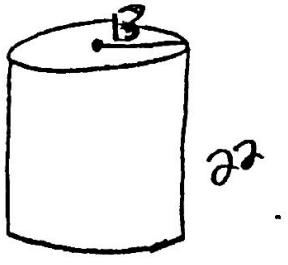
$A = L \cdot W$

$A = (75)(60)$

$\boxed{A = 4500 cm^2}$

Yes, we have enough wrapping paper because we have more than the surface area of the gift.

5. A cylinder has a radius of 13cm and a height of 22cm. Find the surface area of the cylinder to the nearest square centimeter



$r = 13$
$d = 26$
$h = 22$

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

$SA = 2\pi(13)^2 + \pi(26)(22)$

$SA = 2\pi(169) + 572\pi$

$SA = 338\pi + 572\pi$

$SA = 910\pi = 2858.849315$

$= \boxed{2859 cm^2}$

6. A regulation NBA basketball has a surface area of 625π cm². What is the ***diameter*** of a regulation basketball?

$SA = 4\pi r^2$

$\frac{625\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$

$\sqrt{156.25} = \sqrt{r^2}$

$12.5 = r$

$SA = 625\pi$

$r = ?$

$\boxed{d = 2r}$

Don't forget to find diameter → $(12.5)(2) = \boxed{25 cm}$

note the units because it is a length, not an area!

- Make sure to Post answers on the Google Form