6.6 Surface Area and Volume

SWBAT find the surface area and volume of geometric figures.

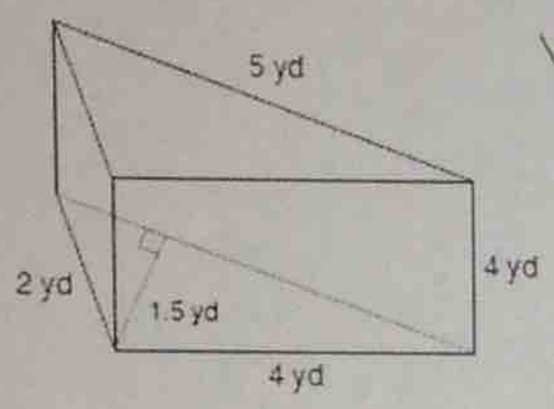
Volume	Prism	Cylinder	Cone	Sphere	Pyramid
	$V = Bh$	$V = Bh$ $V = \pi r^2 h$	$V = \frac{1}{3}Bh$ $V = (\pi r^2 h)/3$	$V = \frac{4\pi r^3}{3}$	$V = \frac{Bh}{3}$

* B = area of the base

Volume of Regular Figures

Find the volume of the following figures. Show all work.

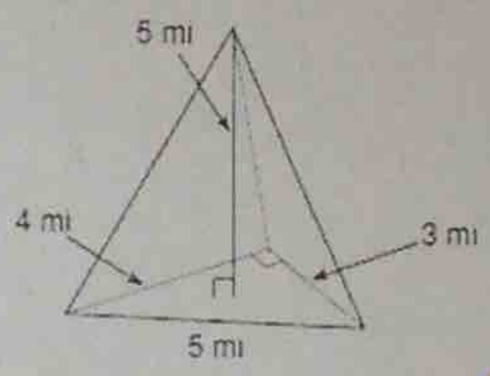
a)



$V = \frac{(5)(1.5)(4)}{2}$

$V = 15\ yd^3$

b)

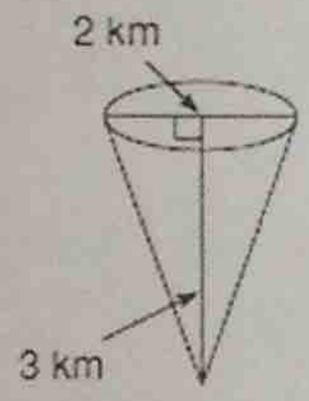


$V = \frac{(3)(4)}{2} \cdot \frac{(5)}{3}$

$V = \frac{60}{6} = 10$

$V = 10\ mi^3$

c)

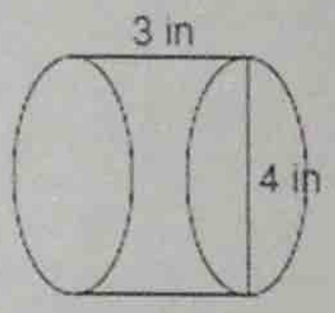


$V = \frac{\pi r^2 h}{3}$

$V = \frac{(3.14)(1)^2(3)}{3}$

$V = 3.14\ km^3$

d)



$V = Bh$

$V = (3.14)(2)^2(3)$

$V = 37.68\ in^3$

e) You buy two cylindrical candles with different dimensions. Candle A has a diameter of 4 inches and a height 8 inches. Candle B has a diameter of 6 and a height of 5. Which candle contains more wax?

Candle A $= (3.14)(4)(8)$

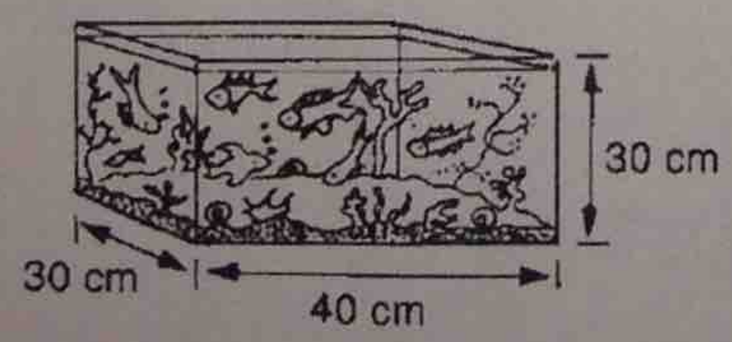
$= 100.48\ in^3$

Candle B $= (3.14)(3)^2(5)$

$= 141.3\ in^3$

Candle B has more wax

f) If one guppy requires 5 L of water to live happily, what is the maximum number of guppies that should be kept in this aquarium?



$1\ L = 1000\ cm^3$

$V = (30)(40)(30)$

$V = 36000\ cm^3$

$\frac{36000}{1000} = 36\ L$

$\frac{36\ L}{5\ L} = 7.2$

7 guppies

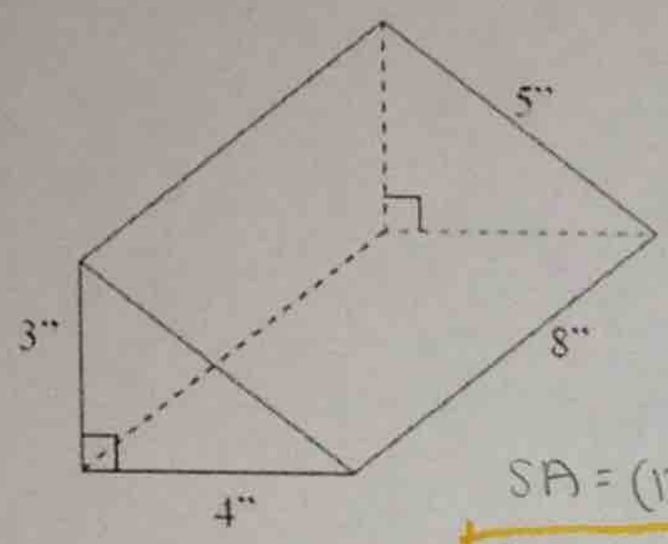
Surface Area	Prism	Cylinder	Cone	Sphere
	$SA = ph + 2B$	$SA = ph + 2B$ $SA = 2\pi rh + 2\pi r^2$	$SA = \pi r^2 + \pi rl$	$SA = 4\pi r^2$

Lateral Area: The area of the sides of a three-dimensional figure. This area excludes the area of the base(s).

Surface Area of Regular Figures

Find the surface area of the following figures. Show all work.

a)



$P = 12$

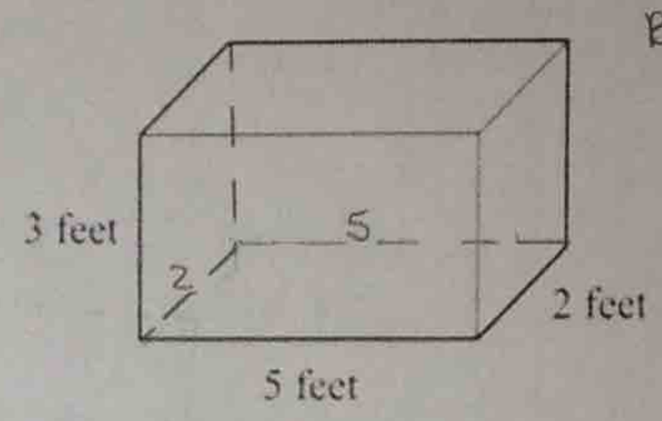
$h = 8$

$B = \frac{(3)(4)}{2} = 6$

$SA = (12)(8) + 2(6)$

$SA = 108\ in^2$

b)



$B = 10$

$SA = (14)(3) + 2(10)$

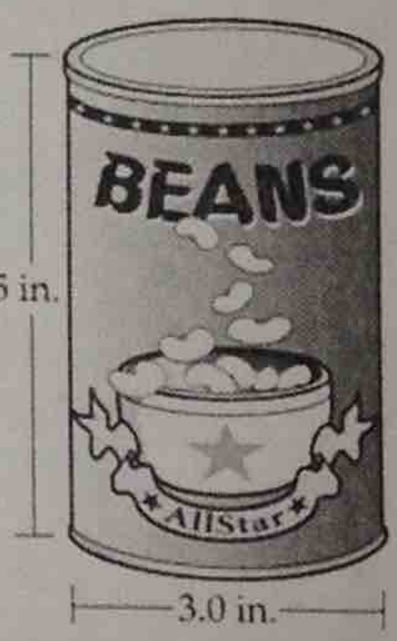
$SA = 62\ ft^2$

c) A cylindrical can of beans is shown below. What is the area of the label that surrounds the can without overlapping? Round answer of the nearest tenth of a square inch.

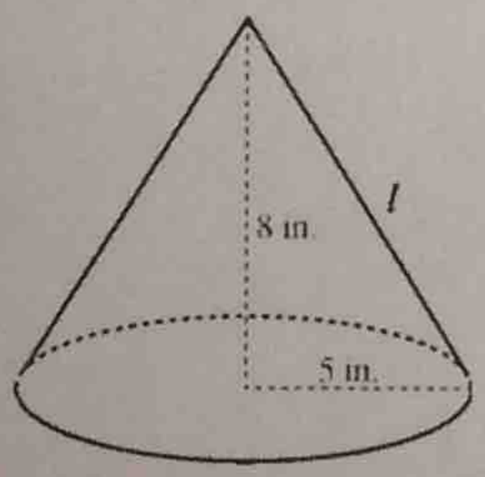
$LA =$ circumference $\times$ height

$LA = 2(3.14)(1.5)(4.5)$

$LA = 42.4\ in^2$



d) What is the lateral area of the cone shown?



$LA = \pi rl$

$l^2 = 8^2 + 5^2$

$l = 89$

$l = 9.4$

$LA = (3.14)(5)(9.4)$

$LA = 147.58\ in^2$

e) A classroom globe as a diameter of 18 inches. Find the approximate surface area, in square inches, of the globe.

$SA = 4(3.14)(9)^2$

$SA = 1017.36\ in^2$