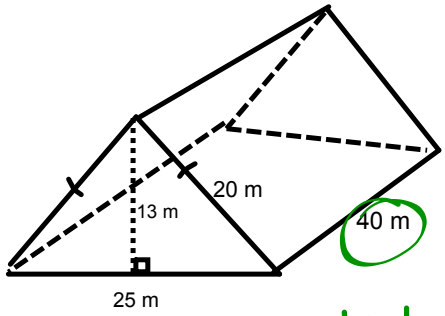
Warm Up Grade 8

May 30, 2017

Find the volume



Step 1) $A_{base\Delta} = \frac{b \times h}{2}$

$= \frac{25m \times 13m}{2}$

$= \frac{325m^2}{2}$

$= 162.5m^2$

Step 2)

$V = A_{base\Delta} \times H$

$= 162.5m^2 \times 40m$

$V = 6500m^3$

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1. If a rectangular prism is cut in half, each of the triangular prism will be the same and each will be half the volume of the rectangular prism

2. In a triangular prism, the only face that can be used as the base is the triangle.

3a) Vol of Rect Prism = $450 cm^3$

Volume of Each Triangular Prism $= \frac{450}{2}$
$= 225 cm^3$

b) Vol of Rect Prism = $624 cm^3$

Vol of each Triangular Prism $= \frac{624}{2}$
$= 312 cm^3$

Homework Solutions

4a) $A_{base} = 9.2\,cm^2$ $h = 2.3\,cm$

$Vol = A_{base} \times h$
$= 9.2 \times 2.3$
$= 21.16\,cm^3$

$$\begin{array}{r} 9.2 \\ \times 2.3 \\ \hline 276 \\ 184 \\ \hline 21.16 \end{array}$$

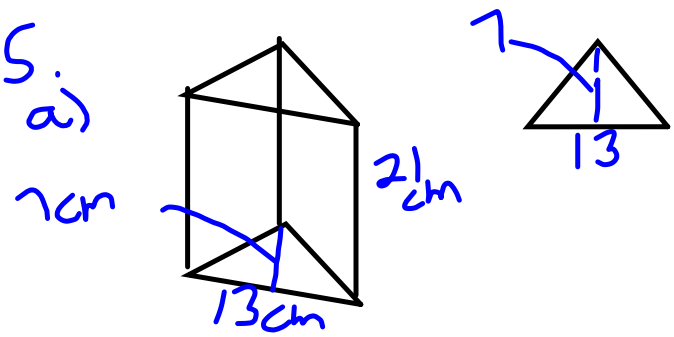
b) $A_{base} = 43.5\,cm^2$ $h = 5\,cm$

$Vol = A_{base} \times h$
$= 43.5 \times 5$
$= 217.5\,cm^3$

c) $A_{base} = 3\,m^2$ $h = 15\,m$

$Vol = A_{base} \times h$
$= 3 \times 15$
$= 45\,m^3$

5.
a)

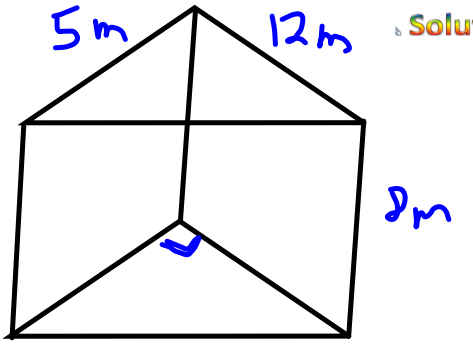


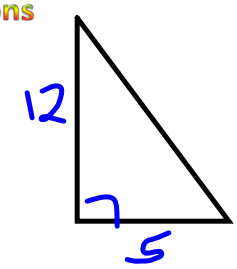
$A_{base} = \frac{b \times h}{2}$
$= \frac{13 \times 7}{2}$
$= \frac{91}{2}$
$= 45.5\,cm^2$

$Vol = A_{base} \times h$
$= 45.5 \times 21$
$= 955.5\,cm^3$

Homework Solutions

b)





$A_{base} = \frac{b \times h}{2}$

$= \frac{12 \times 5}{2}$

$= \frac{60}{2}$

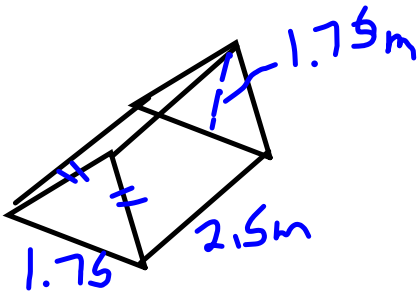
$= 30m^2$

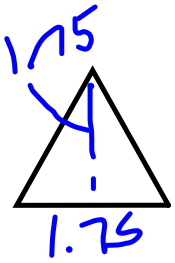
$Vol = A_{base} \times h$

$= 30 \times 8$

$= 240m^3$

c)





$A_b = \frac{b \times h}{2}$

$= \frac{1.75 \times 1.75}{2}$

$= \frac{3.0625}{2}$

$= 1.53125m^2$

$Vol = A_{base} \times h$

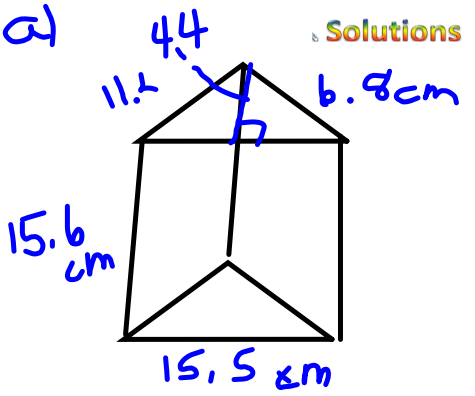
$= 1.53125 \times 2.5$

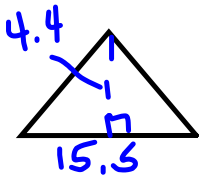
$= 3.828125m^3$

or $3.8m^3$

Homework
Solutions

6 a)





$A_{base} = \frac{b \times h}{2}$

$= \frac{15.5 \times 4}{2}$

$= \frac{68.2}{2}$

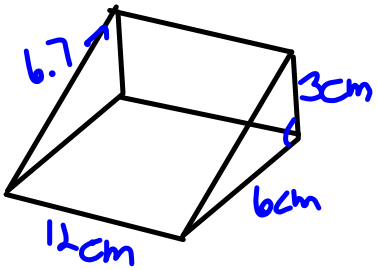
$= 34.1 cm^2$

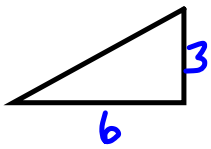
$Vol = A_{base} \times h$

$= 34.1 \times 15.6$

$= 531.96 cm^3$

b)





$A_3 = \frac{b \times h}{2}$

$= \frac{6 \times 3}{2}$

$= \frac{18}{2}$

$= 9 cm^2$

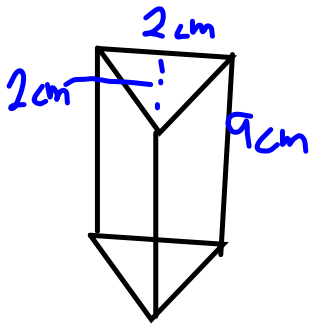
$Vol = A_{base} \times h$

$= 9 \times 12$

$= 108 cm^3$

Homework Solutions

7.



$A_b = \frac{b \times h}{2}$

$= \frac{2 \times 2}{2}$

$= \frac{4}{2}$

$= 2cm^2$

$Vol = A_b \times h$

$= 2 \times 9$

$= 18cm^3$

8. $Vol = 30cm^3$ $A_{base} = 4cm^2$

$h = \frac{30}{4}$

$= 7.5cm$

$V = A_{base} \times H$

$\frac{30}{4} = \frac{4H}{4}$

$\boxed{7.5 = H}$

Homework Solutions

9. . $Vol = A_b \times h$

a) $5 = \_\_ \times \_\_$

$A_b = 1cm^2$ $h = 5cm$
$A_b = 2cm^2$ $h = 2.5cm$

b) $9m^3 = \_\_ \times \_\_$

$A_b = 1m^2$, $h = 9m$
$A_b = 3m^2$, $h = 3m$
$A_b = 9m^2$, $h = 1m$

c) $8m^3 = \_\_ \times \_\_$

$A_b = 1m^2$ $h = 8m$
$A_b = 2m^2$ $h = 4m$
$A_b = 4m^2$ $h = 2m$
$A_b = 8m^2$ $h = 1m$

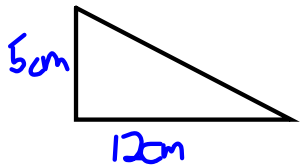
d) $18cm^3 = \_\_ \times \_\_$

$A_b = 2m^2$ $A = 9m$
$A_b = 3m^2$ $A = 6m$

b) To find all possibilities, list the factors.

10. Sketch

Homework Solutions



$A_b = \frac{b \times h}{2}$
$= \frac{12 \times 5}{2}$
$= \frac{60}{2}$
$= 30cm^2$

$Vol = A_b \times h$
$= 30 \times 4$
$= 120cm^3$

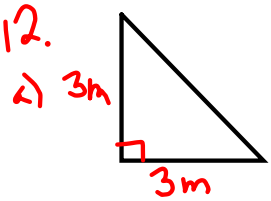
b) $\frac{120}{20} = 6$ people will be served cheese.

11. $Vol = A_{base} \times h$
$50 = A_{base} \times 5$
10×5

Homework Solutions

so A_{base} (or triangular face) is $10m^2$

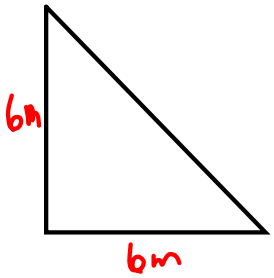
12.
a)



$A_b = \frac{b \times h}{2}$
$= \frac{3 \times 3}{2}$
$= \frac{9}{2}$
$= 4.5m^2$

$Vol = A_{base} \times h$
$= 4.5 \times 0.25$
$= 1.125m^3$

b)



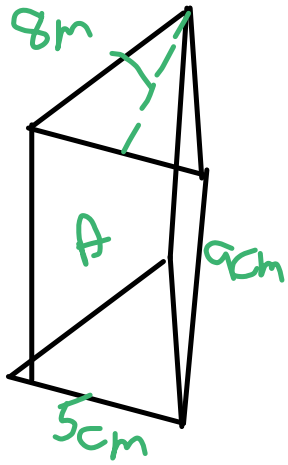
$A = \frac{b \times h}{2}$
$= \frac{6 \times 6}{2}$
$= \frac{36}{2}$
$= 18m^2$

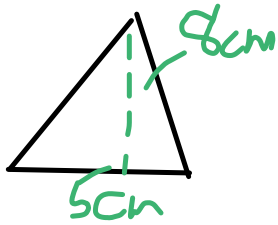
$Vol = A_b \times h$
$= 18 \times 0.25$
$= 4.5m^3$

Jackie needs 4 times as much concrete

13. a) Prediction
Prism A

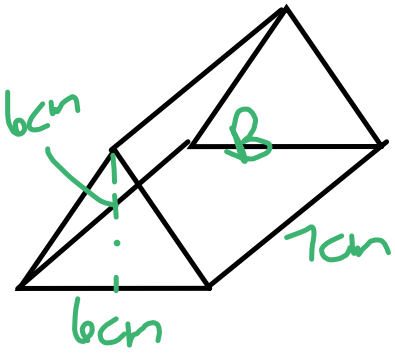
b)





$A_b = \frac{b \times h}{2}$
$= \frac{8 \times 5}{2}$
$= \frac{40}{2}$
$= 20cm^2$

$Vol = A_b \times h$
$= 20 \times 9$
$= 180cm^3$



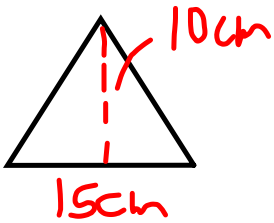
$A_b = \frac{b \times h}{2}$
$= \frac{6 \times 6}{2}$
$= \frac{36}{2}$
$= 18cm^2$

$V = A_b \times h$
$= 18 \times 7$
$= 126 cm^3$

Prediction was correct

c) If Prism B had a height of 10cm it would have the same volume as A.

14 Sketch



$A_b = \frac{b \times h}{2}$

$= \frac{15 \times 10}{2}$

$= \frac{150}{2}$

$= 75 cm^2$

Vol = $A_b \times h$

$= 75 \times 30$

$= 2250 cm^3$

b) Contains 1350 ml of water

depth = ?

1350 ml = 1350 cm^3

Vol = $A_{base} \times h$

$1350 = 75 \times h$

$\frac{1350}{75} = 18$

The depth would be 18cm

c) $\frac{1350}{2250} = 0.6$ or 60% water

15. Volume = $198\ cm^3$

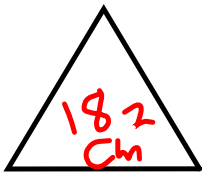
$A_{base} = 18$

$Vol = A_{base} \times h$

$198 = 18 \times h$

$\frac{198}{18} = h$

$\boxed{11 = h}$

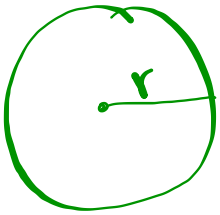


$18 = \frac{b \times h}{2}$

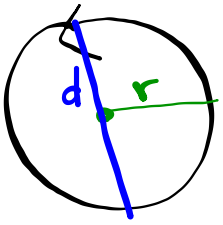
$36 = b \times h$

Base of Δ	Height of Δ	Height of Prism
1	36	11
2	18	11
3	12	11
4	9	11
6	6	11
9	4	11

⋮

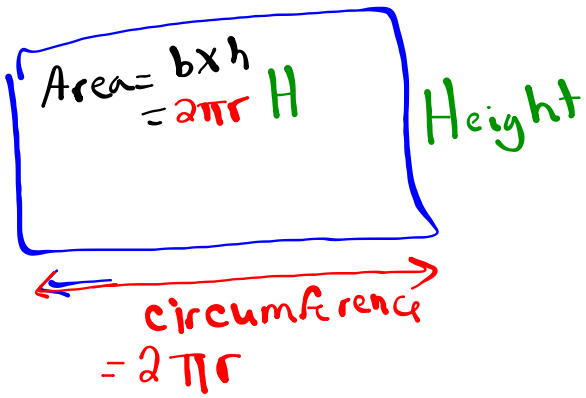


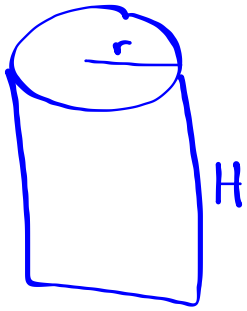
$\text{Area}_{\bigcirc} = \pi r^2$



$\text{Circumference}_{\bigcirc} = \pi d$
or
$2\pi r$

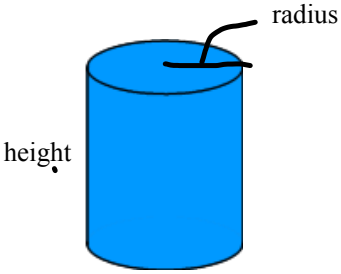
$$\text{Total } SA_{cyl} = 2\,\text{Area of circle} + \boxed{\text{Rec}}$$
$$= 2\pi r^2 + 2\pi r H$$


Area = b x h
= 2πr H
Height
circumference
= 2πr


r
H

Surface Area of a Cylinder

When finding the surface area of a cylinder, you still have to find the area of the faces then add them. However, what are the shapes of the faces?



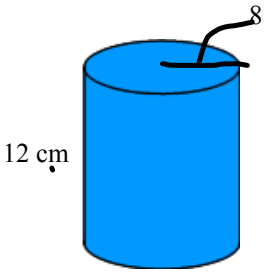
The top and bottom are both Circles

If you unroll the curved face of the cylinder, you will get a rectangle

One side of the rectangle is the height of the cylinder,
and
the other side of the rectangle is the circumference of the circle

Step 1) Find the area of the circle
Step 2) Find the circumference of the circle
Step 3) Find the area of the rectangle A = bxh
= circumference x h
Step 4) Find the Total SA = 2Circles +Rectangle

$$\text{Total SA of cyl} = 2\pi r^2 + 2\pi r H$$



r = 8cm

H = 12cm

Step 1) Find the area of the circle

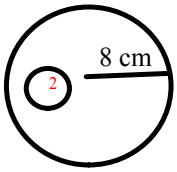
Step 2) Find the circumference of the circle

Step 3) Find the area of the rectangle A = bxh

= circumference x h

Step 4) Find the Total SA = 2Circles +Rectangle

Top and Bottom



Step 1)

Area $= \pi r^2$

$= 3.14(8cm)^2$

$= 3.14 \times 64cm^2$

$= 200.96\ cm^2$

Curved Face

Step 2) Circumference $= 2\pi r \times H$

$= 2(3.14)(8cm \times (12)$

$= 602.88\ cm^2$

Step 3) Area =

=

=

Step 4)

Surface Area = 2 circles + $\boxed{Rec}$

$= 2(200.96cm^2) + 602.88cm^2$

$= 401.92cm^2 + 602.88\ cm^2$

$= 1004.8cm^2$

$$\text{Total SA}_{cyl} = 2\pi r^2 + 2\pi r H$$

$$= 2(3.14)(8cm)^2 + 2(3.14)(8cm)(12cm)$$

$$= \underbrace{2(3.14)(64cm^2)}_{\text{multi}} + \underbrace{2(3.14)(8cm)(12cm)}_{\text{multiply}}$$

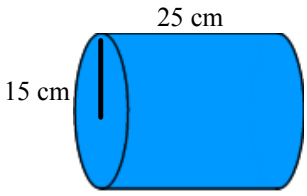
$$= 401.92cm^2 + 602.88cm^2$$

$$= 1004.8\ cm^2$$

Must Follow BEDMAS

Your Turn

Find the surface area



$r = \boxed{15\text{ cm}}$

$H = \boxed{25\text{ cm}}$

$$\text{Total SA}_{cyl} = 2\pi r^2 + 2\pi r H$$

$$= 2(3.14)(15\text{cm})^2 + 2(3.14)(15\text{cm})(25\text{cm})$$

$$= \underbrace{2(3.14)(225\text{cm}^2)}_{} + \underbrace{2(3.14)(15\text{cm})(25\text{cm})}_{}$$

$$= 1413\text{cm}^2 + 2355\text{ cm}^2$$

$$= 3768\text{ cm}^2$$

Surface Area of a Cylinder

When finding the surface area of a cylinder, you still have to find the area of the faces then add them. However, what are the shapes of the faces?

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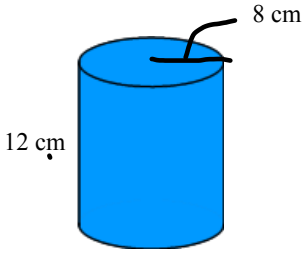
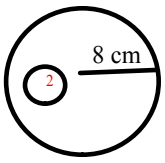


The top and bottom are both circles.

If you unroll the curved face of the cylinder, you will get a rectangle. One side of the rectangle is the height of the cylinder, and the other side of the rectangle is the circumference of the circle

Top and Bottom



Area $= \pi r^2$
$= 3.14 \times 8^2$
$= 3.14 \times 64$
$= 200.96\ cm^2$

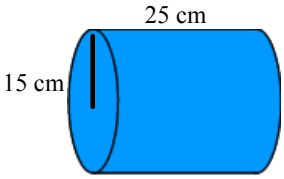
Curved Face

Circumference
$= \pi \times d$
$= 3.14 \times 16$
$= 50.24$ cm

r = 8
d = 16

Area = $l \times w$
$= 50.24 \times 12$
$= 602.88\ cm^2$

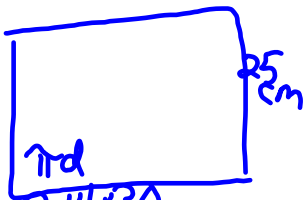
Surface Area $= 2 \times 200.96 + 602.88$
$= 401.92 + 602.88$
$= 1004.8\ cm^2$



Top and Bottom

$A = \pi r^2$
$= 3.14 \times 15^2$
$= 3.14 \times 225$
$= 706.5\ cm^2$

Curved Face



3.14×30
$94.2\ cm$

$A = l \times w$
$= 94.2 \times 25$
$= 2355\ cm^2$

$SA = 2 \times 706.5 + 2355$
$= 1413 + 2355$
$= 3768\ cm^2$

Class/Homework

$r = \frac{1}{2}d$

Ex) $d = 4$

$\boxed{r = 2}$

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~~#16~~

#4 a b

#6 a b c

$$\text{Total } SA_{cyl} = 2\pi r^2 + 2\pi r H$$

$$2(3.14)(\ )^2 + 2(3.14)(\ )(\ )$$