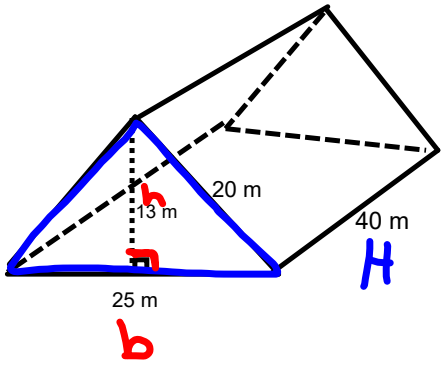
Warm Up Grade 8

Find the volume



$V = A_{base} \times H$

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

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

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

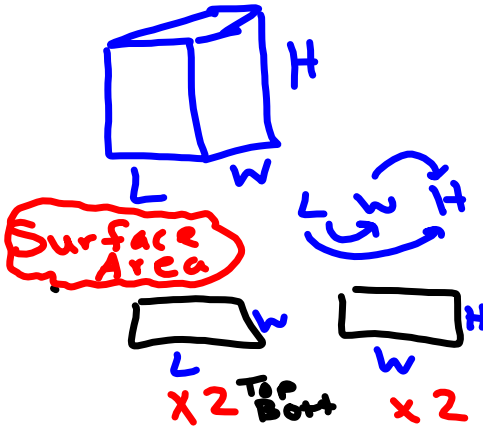
$= 162.5m^2$

$V = A_{base} \times H$

$= 162.5m^2 \times 40m$

$= 6500m^3$

Rectangular Prism

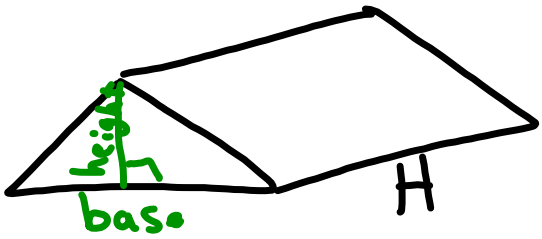


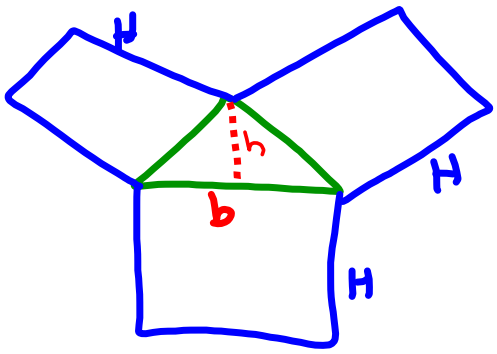
Total SA

Volume

$A_{base} \times H$

$(L \times W) \times H$

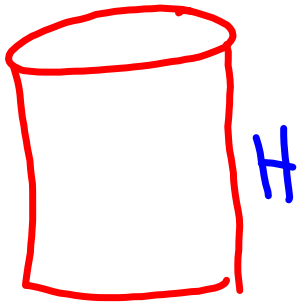




$A_{\triangle} = \frac{\text{base} \times \text{height}}{2}$

Total S.A = $2\triangle$ + ▭ + ▭ + ▭

Volume = $A_{\text{base}\triangle} \times H$

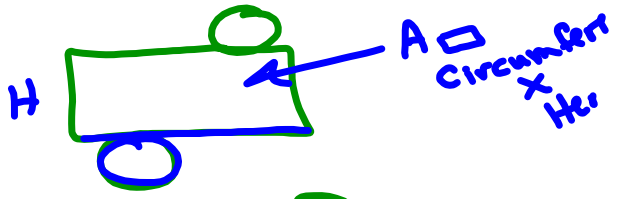


Circumference of circle

πd

or $2\pi r$

Net



2 circles + Rectangle

circumference x H

$2\pi r^2$ + $2\pi r H$

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

$Vol = A_{base} \times h$

$= 9.2 \times 2.3$

$= 21.16\,cm^3$

9.2
×2.3
276
1840
21.16

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

$Vol = A_{base} \times h$

$= 43.5 \times 5$

$= 217.5\,cm^3$

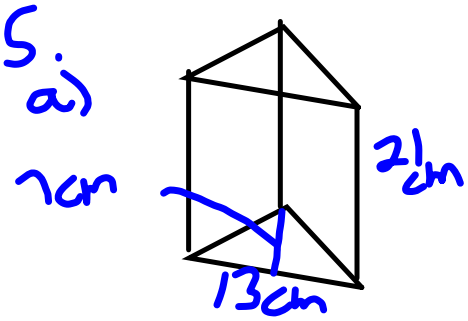
c) $A_{base} = 3\,m^2$ $h = 15\,m$

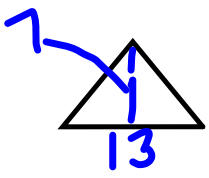
$Vol = A_{base} \times h$

$= 3 \times 15$

$= 45\,m^3$

5. a)





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

$= \frac{13 \times 7}{2}$

$= \frac{91}{2}$

$= 45.5\,cm^2$

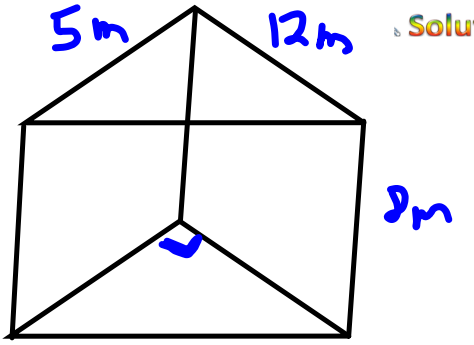
$Vol = A_{base} \times h$

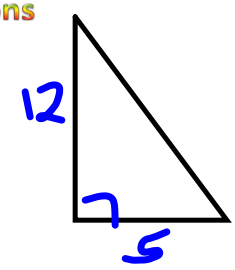
$= 45.5 \times 21$

$= 955.5\,cm^3$

Homework
Solutions

b)





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

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

$= \frac{60}{2}$

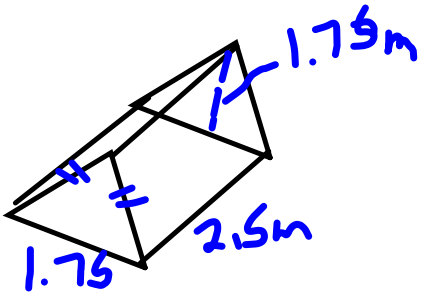
$= 30 m^2$

$Vol = A_{base} \times h$

$= 30 \times 8$

$= 240 m^3$

c)



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

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

$= \frac{3.0625}{2}$

$= 1.53125 m^2$

$Vol = A_{base} \times h$

$= 1.53125 \times 2.5$

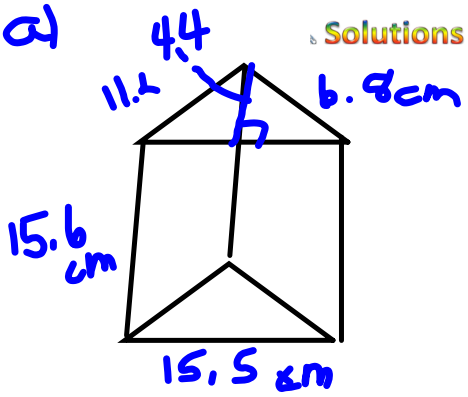
$= 3.828125 m^3$

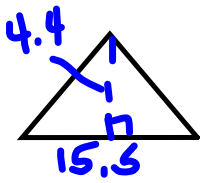
or $3.8 m^3$

Homework

Solutions

6 a)





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

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

$= \frac{68.2}{2}$

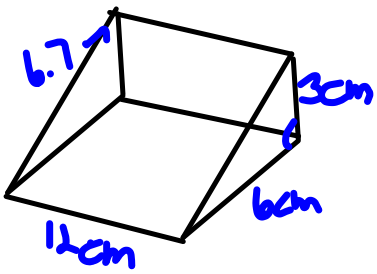
$= 34.1 cm^2$

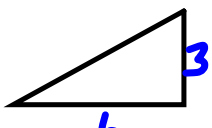
$Vol = A_{base} \times h$

$= 34.1 \times 15.6$

$= 531.96 cm^3$

b)





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

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

$= \frac{18}{2}$

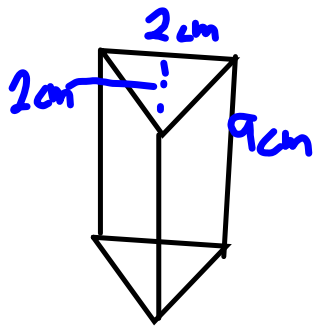
$= 9 cm^2$

$Vol = A_{base} \times h$

$= 9 \times 12$

$= 108 cm^3$

7.



Homework Solutions

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

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

$= \frac{4}{2}$

$= 2cm^2$

$Vol = A_b \times h$

$= 2 \times 9$

$= 18cm^3$

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

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

$= 7.5cm$

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

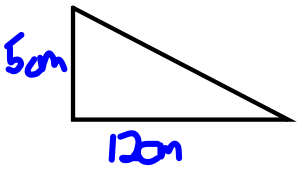
$A_b = 2m^2$ $A = 9m$

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

b) To find all possibilities, list the factors.

10. Sketch

Homework
Solutions



$A_b = \frac{bxh}{2}$
$= \frac{12x5}{2}$
$= \frac{60}{2}$
$= 30cm^2$

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

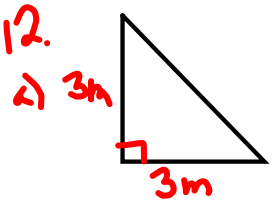
b) $\frac{120}{20} = 6$ people will be served cheese.

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

Homework
Solutions

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

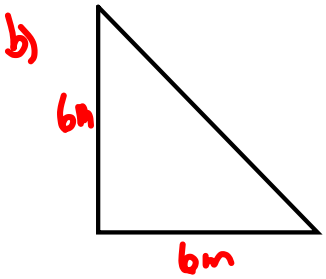
12.
a)



$A_b = \frac{bxh}{2}$
$= \frac{3x3}{2}$
$= \frac{9}{2}$
$= 4.5m^2$

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

b)



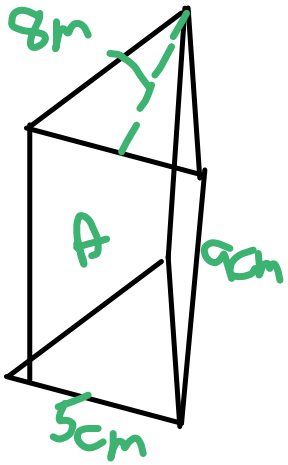
$A = \frac{bxh}{2}$
$= \frac{6x6}{2}$
$= \frac{36}{2}$
$= 18m^2$

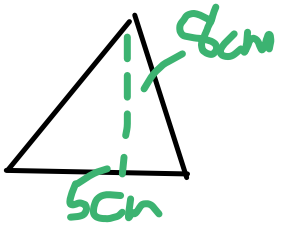
$Vol = A_b \times h$
$= 18 \times 0.25$
$= 4.5m^3$

Jackie needs 4 times as much concrete

13. a) Prediction
Prism A

b)





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

$= \frac{8 \times 5}{2}$

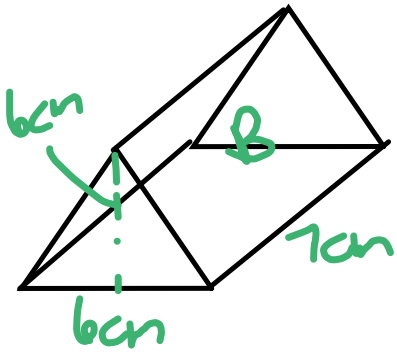
$= \frac{40}{2}$

$= 20cm^2$

$Vol = A_b \times h$

$= 20 \times 9$

$= 180cm^3$



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

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

$= \frac{36}{2}$

$= 18cm^2$

$V = A_b \times h$

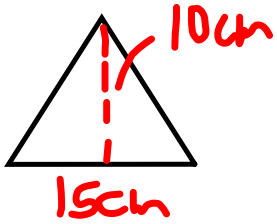
$= 18 \times 7$

$= 126cm^3$

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 = $198\ cm^3$

$A_{base} = 18$

$Vol = A_{base} \times h$

$198 = 18 \times h$

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

$11 = h$

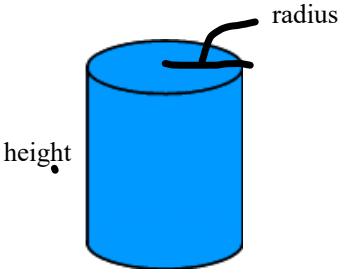
$18 = \frac{b \times h}{2}$

$36 = b \times h$

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

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 _____

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

One side of the _____ is the _____ of the cylinder, and

the other side of the _____ is the _____ of the circle

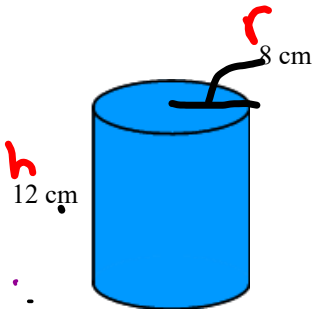
Step 1) Find the area of the circle
Step 2) Find the circumference of the circle
Step 3) Find the area of the rectangle A = bxh

= circumference x h

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

$$SA_{cyl} = 2\pi r^2 + 2\pi rh$$

$= 2 \times 3.14 \times r \times r + 2 \times 3.14 \times r \times H$



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

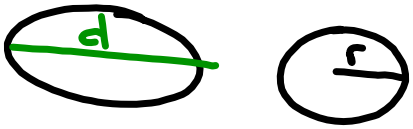
$SA_{cyl} = 2\pi r^2 + 2\pi rh$

$= 2\pi(8\text{ cm})^2 + 2\pi(8\text{ cm})(12\text{ cm})$

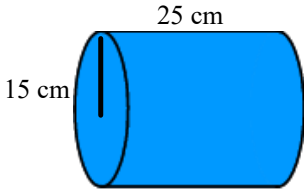
$= 2 \times 3.14 \times 64 + 2 \times 3.14 \times 8 \times 12$

$401.92\text{ cm}^2 + 602.88\text{ cm}^2$

1004.8 cm^2



Find the surface area



Your Turn
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$SA = 2\pi r^2 + 2\pi r h$

$= 2 \times 3.14 \times (15cm)^2 + 2 \times 3.14 \times (15cm) \times (25cm)$

15×15

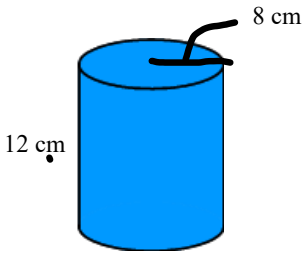
$= 2 \times 3.14 \times 225cm^2 + 2 \times 3.14 \times (15cm) \times (25cm)$

$1413 cm^2 + 2355 cm^2$

$3768 cm^2$

Surface Area of a Cylinder

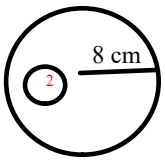
When finding the surface area of a cylinder, you still have to find the area of the faces then add them. However, what are the shapes of the faces?



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 $= \pi r^2$
$= 3.14 \times 8^2$
$= 3.14 \times 64$
$= 200.96 \text{ cm}^2$

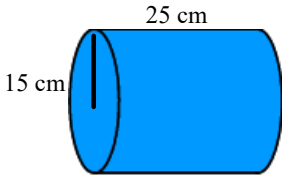
Curved Face

Circumference
$= \pi \times d$
$= 3.14 \times 16$
$= 50.24 \text{ cm}$

r = 8
d = 16

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

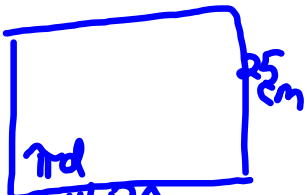
Surface Area = $2 \times 200.96 + 602.88$
$= 401.92 + 602.88$
$= 1004.8 \text{ cm}^2$



Top and Bottom

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

Curved Face



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

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

Class/Homework

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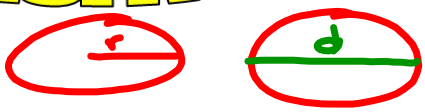
1-6

#4a,b

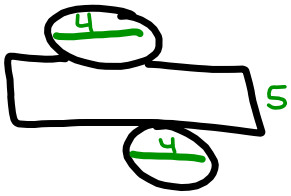
6abc



$r = d \div 2$

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

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



$d = 4$ $2 \div 2$

$r = 2$

$H = 5$

$2 \times \pi \times r^2 + 2 \times \pi r h$