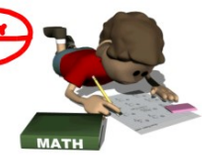
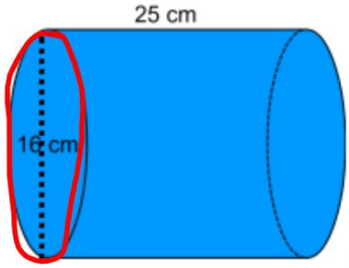
Warm Up Gr 8



1a) Find the amount of plastic needed to cover this cylinder



Given

$d = 16\text{cm} \xrightarrow{\div 2} r = 8\text{cm}$

$H = 25\text{cm}$

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

$= 2(3.14)(8\text{cm})^2 + 2(3.14)(8\text{cm})(25\text{cm})$

$= 2(3.14)(64\text{cm}^2) + 2(3.14)(8\text{cm})(25\text{cm})$

(8×8; multiply; multiply)

$401.92\text{cm}^2 + 1256\text{cm}^2$

1657.92cm^2

Volume fill up

b) Find the capacity of this cylinder

$V_{cyl} = A_{base} \times H$

$= \pi r^2 H$

$= (3.14)(8\text{cm})^2(25\text{cm})$

$= 3.14(64\text{cm}^2)(25\text{cm})$ (multiply)

$= 5024\text{cm}^3$

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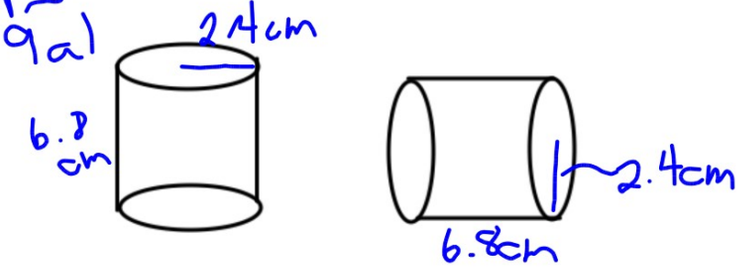
9a)



The volumes will be the same, both have a radius of 2.4cm and a height of 6.8cm. It is the same cylinder, just placed differently

10.

Bottle A

$A_b = \pi r^2$
$= 3.14 \times 3.5^2$
$= 38.465$

$Vol = A_b \times h$
$= 38.465 \times 3$
$= 115.4\ cm^3$
not big enough

Bottle B

$A_b = \pi r^2$
$= 3.14 \times 2^2$
$= 12.56$

$Vol = A_b \times h$
$= 12.56 \times 6$
$= 75.36$ not big enough

Bottle C

$A_b = \pi r^2$
$= 3.14 \times 3.5^2$
$= 38.465$

$Vol = A_b \times h$
$= 38.465 \times 7$
$= 269.255\ cm^3$

Bottle D

$A_b = \pi r^2$
$= 3.14 \times 1.5^2$
$= 7.065$

$Vol = A_b \times h$
$= 7.065 \times 4$
$= 28.26$ too small

Bottle C will hold the water

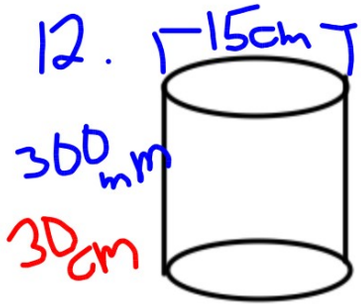
11. $h = 12cm$ $r = 3.5cm$

$A_b = \pi r^2$
$= 3.14 \times 3.5^2$
$= 38.465 cm^2$

$Vol = A_b \times h$
$= 38.465 \times 12$
$= 461.58 cm^3$
or $461.58 ml$

b) $r = 12$ $h = 3.5$

If the radius and height are switched, the new volume will be greater. You square the radius, and 12^2 is much bigger than 3.5^2

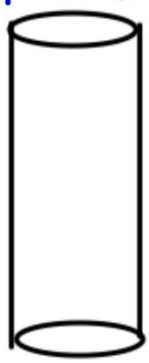
12. 

$d = 15cm$
$r = 7.5cm$

$A_b = \pi r^2$
$= 3.14 \times 7.5^2$
$= 3.14 \times 56.25$
$= 176.625 cm^2$

$Vol = A_b \times h$
$= 176.625 \times 30$
$= 5298.75 cm^3$

13. 1-15cm



25m
2500 cm

$d = 15cm$
$r = 7.5$
$A = 176.625cm^2$ (see #12)

$Vol = A_b \times h$
$= 176.625 \times 2500$
$= 441562.5cm^3$ of soil removed

$1m^3 = 1\,000\,000\ cm^3$

$0.442\ m^3$

14. $r = 91cm$ $h = 122cm$

$A_b = \pi r^2$
$= 3.14 \times 91^2$
$= 3.14 \times 8281$
$= 26002.34cm^2$

$Vol = A_b \times h$
$= 26002.34 \times 122$
$= 3172285.48cm^3$
for one container

3172285.48×3
$9516856.44cm^3$
$9.51685644\ m^3$

15. $d = 7cm$ $h = 12cm$

1.5cm left at top for expansion

Height of Conc in can

$12 - 1.5 = 10.5cm$

$A_b = \pi r^2$

$= 3.14 \times 3.5^2$

$= 38.465 cm^2$

$Vol = A_b \times h$

$= 38.465 \times 10.5$

$= 403.88 cm^3$

17. $h = 10m$

$d = 3.5m \rightarrow r = 1.75$

a)

$A_b = \pi r^2$

$= 3.14 \times 1.75^2$

$= 3.14 \times 3.0625$

$= 9.61625 m^2$

$Vol = A_b \times h$

$= 9.61625 \times 10$

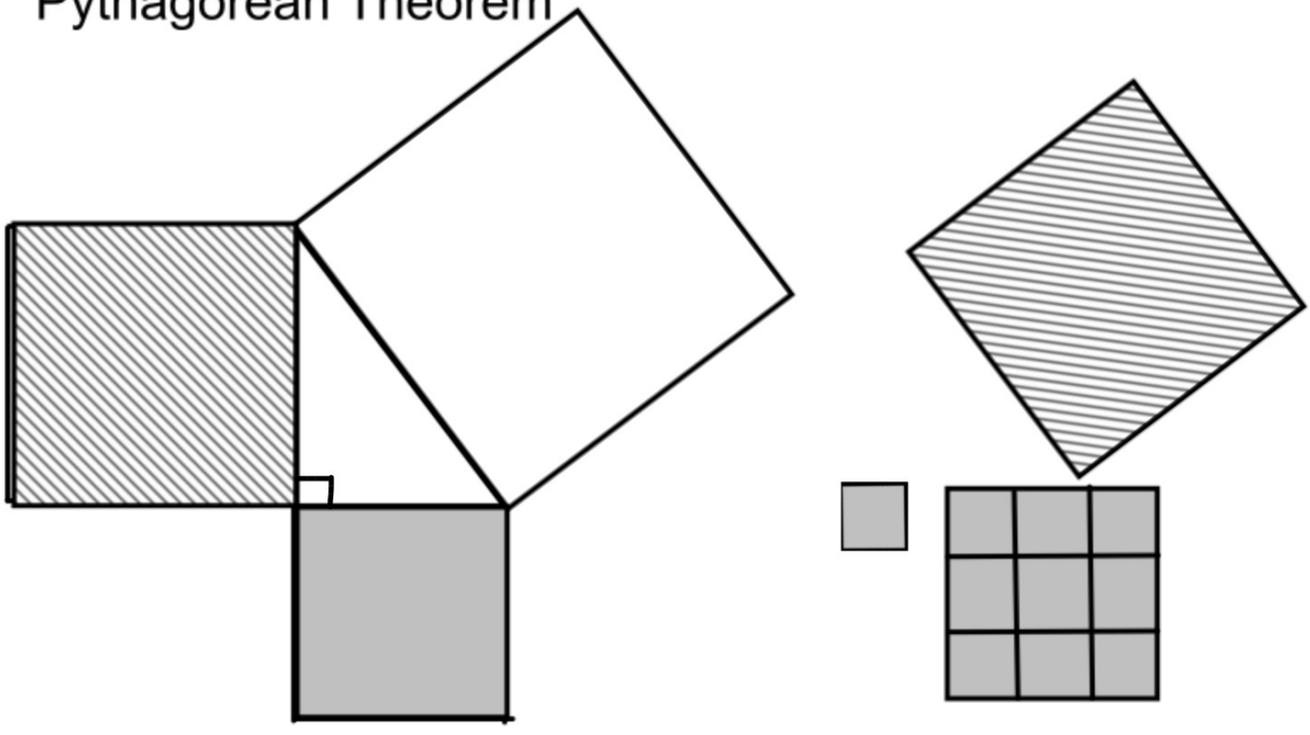
$= 96.1625 m^3$

b) 127 columns

Total volume 96.1625×127

$= 12212.64 m^3$

Pythagorean Theorem



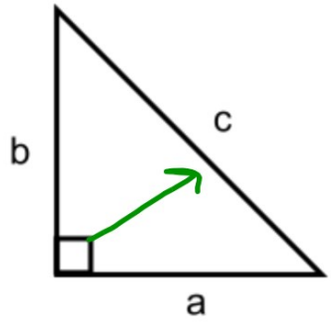
Pythagorean Theorem

- Right Angle Triangle has one angle that 90°

- the side directly across to the right angle is always the longest side, it is the **hypotenuse.**

We use "c" for the hypotenuse

- Legs are side "a" and "b"



Pythagorean Theorem Equation:

looking for c

$$(a)^2 + (b)^2 = (c)^2$$

area of the square off the hypotenuse

looking for leg a or b

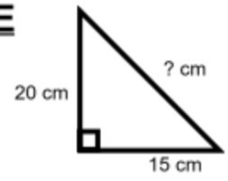
$$(c)^2 - (b)^2 = (a)^2$$

area of the square off the leg

Pythagorean Theorem Equation:

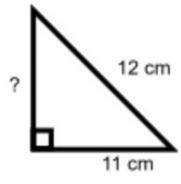
Then to find the length of the **HYPOTENUSE**

$$c = \sqrt{(a)^2 + (b)^2}$$



Then to find the length of a **LEG**

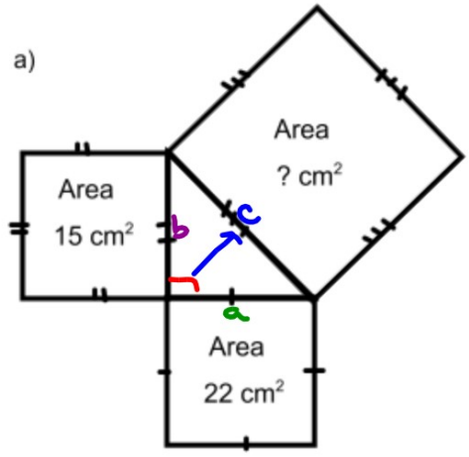
$$a = \sqrt{(c)^2 - (b)^2}$$



Example)

Find the area of the indicated square:

a)



Given

$a^2 = 22cm^2$

$b^2 = 15cm^2$

$c^2 = ?$

$c^2 = a^2 + b^2$

$c^2 = 22cm^2 + 15cm^2$

$c^2 = 37cm^2$

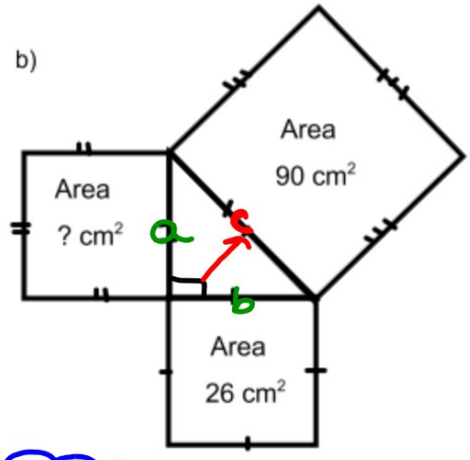
To find 'c' take $\sqrt{\ }$ of each side

$\sqrt{c^2} = \sqrt{37cm^2}$

$c = \sqrt{37}\ cm$

$c \approx 6.01cm$

b)



Given

$c^2 = 90cm^2$

$b^2 = 26cm^2$

$a^2 = ?$

$a^2 = c^2 - b^2$

$a^2 = 90cm^2 - 26cm^2$

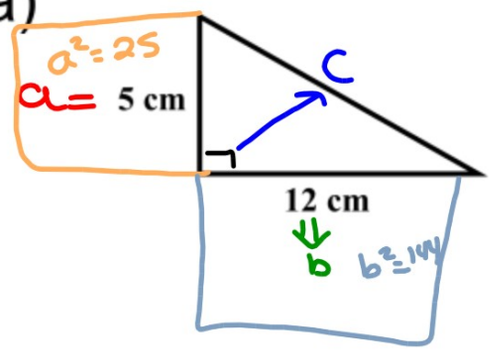
$a^2 = 64cm^2$

$\sqrt{a^2} = \sqrt{64cm^2}$

$a = 8cm$

Examples: Find the length of the missing side.

2a)



Given
$a = 5\text{cm}$
$b = 12\text{cm}$
$c = ?$

$c^2 = a^2 + b^2$

$c^2 = (5\text{cm})^2 + (12\text{cm})^2$

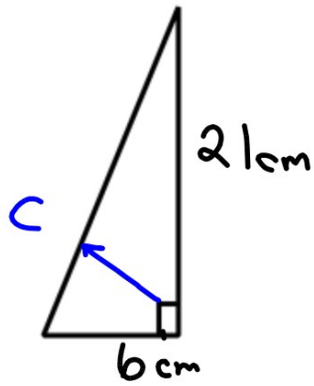
$c^2 = 25\text{cm}^2 + 144\text{cm}^2$

$c^2 = 169\text{cm}^2$

$\sqrt{c^2} = \sqrt{169\text{cm}^2}$

$c = 13\text{cm}$

2b)



Given
$a = 6\text{cm}$
$b = 21\text{cm}$
$c = ?$

$c^2 = a^2 + b^2$

$c^2 = (6\text{cm})^2 + (21\text{cm})^2$

$c^2 = 36\text{cm}^2 + 441\text{cm}^2$

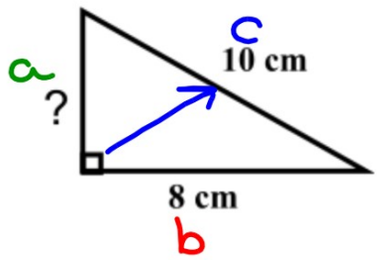
$c^2 = 477\text{cm}^2$

$\sqrt{c^2} = \sqrt{477\text{cm}^2}$

$c \approx 21.8\text{ cm}$

Examples: Find the length of the missing side.

3a)



Given

$c = 10cm$

$b = 8cm$

$a = ?$

$a^2 = c^2 - b^2$

$a^2 = (10cm)^2 - (8cm)^2$

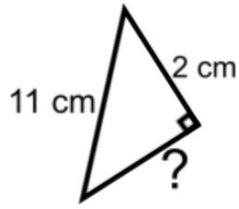
$a^2 = 100cm^2 - 64cm^2$

$a^2 = 36cm^2$

$\sqrt{a^2} = \sqrt{36cm^2}$

$a = 6cm$

3b)



Answer 10.8

Given

$c = 11cm$

$b = 2cm$

$a = ?$

$a^2 = c^2 - b^2$

$a^2 = (11cm)^2 - (2cm)^2$

$a^2 = 121cm^2 - 4cm^2$

$a^2 = 117cm^2$

$\sqrt{a^2} = \sqrt{117cm^2}$

$a = 10.8cm$