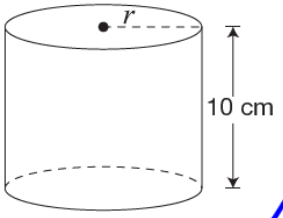
Review and EQAO Practice for Chapter 8 – Surface Area and Volume

2017

2 The cylinder pictured below has a volume of 500 cm^3 and a height of 10 cm.



Which of the following represents the radius of the cylinder, *r*, in centimetres?

Hint:
$V = \pi r^2 h$

$V = \pi r^2 h$

$500 = \pi r^2 \cdot 10$

$\frac{500}{10} = \frac{\pi r^2 \cdot 10}{10}$

$50 = \pi r^2$

$\frac{50}{\pi} = \frac{\pi r^2}{\pi}$

$\frac{50}{\pi} = r^2$

$\sqrt{\frac{50}{\pi}} = r$

a $\sqrt{\frac{50}{\pi}}$

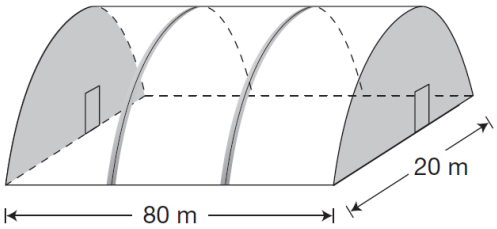
b $\frac{\sqrt{50}}{\pi}$

c $\frac{50}{\pi}$

d $\frac{50}{2\pi}$

2016

20 This diagram shows a greenhouse that is built in the shape of a half-cylinder.



Material to cover the roof costs \$3/m^2. The shaded ends will not be covered. Which is closest to the cost of covering the roof?

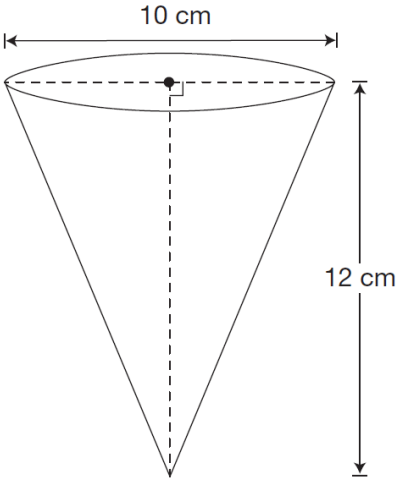
a \$7540

b \$12 570

c \$15 080

d \$37 700

21 A cone is pictured below.



Hint:
Use Pythagorean theorem as part of your process.

Which of the following is closest to the surface area of the cone?

a 267 cm^2

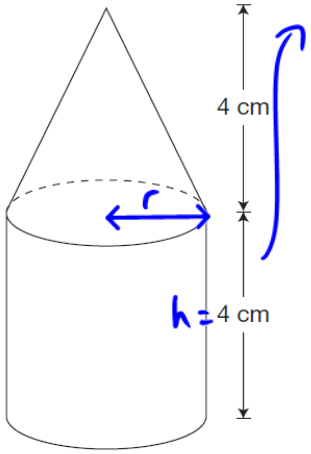
b 283 cm^2

c 691 cm^2

d 723 cm^2

2015

29 The figure pictured below is made up of a cone on top of a cylinder.



$V_{cylinder} = \pi r^2 h$

$96 = \pi r^2 (4)$

$\frac{96}{\pi(4)} = \frac{\pi r^2 (4)}{\pi(4)}$

$\frac{96}{\pi(4)} = r^2$

$\sqrt{\frac{96}{\pi(4)}} = r$

$2.764 = r$

The cylinder has a volume of 96 cm^3.

What is the volume of the figure?

a 120 cm^3

b 128 cm^3

c 144 cm^3

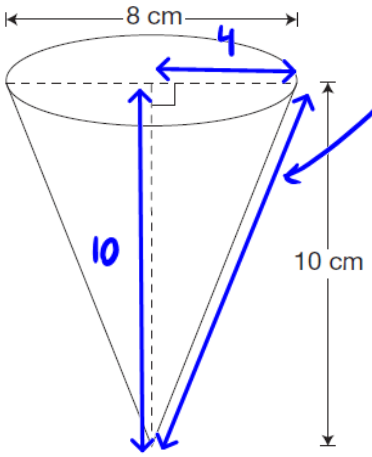
d 192 cm^3

use the radius to find the volume of the cone

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

2013

25 An open-topped paper drinking cup in the shape of a cone is pictured below.



$c^2 = 4^2 + 10^2$

$c^2 = 16 + 100$

$c^2 = 116$

$c = \sqrt{116}$

$c = 10.8$

Which is closest to the amount of paper required to make the cup?

a 185 cm^2

b 167 cm^2

c 135 cm^2

d 126 cm^2

Lateral surface (no top)

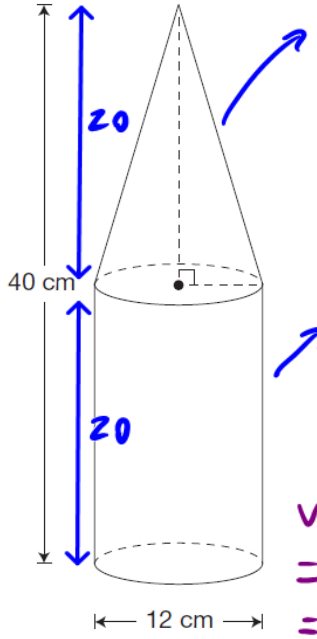
$= \pi r s$

$= \pi(4)(10.8)$

$= 135.7 \text{ cm}^2$

2014

27 The container pictured below is made up of a cone and a cylinder. The cone and the cylinder have the same height.



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

$= \frac{\pi (6)^2 \cdot 20}{3}$

$= 753.98 \text{ cm}^3$

$V_{cylinder} = \pi r^2 h$

$= \pi (6)^2 \cdot 20$

$= 2261.94 \text{ cm}^3$

$V_{cone} + V_{cylinder}$

$= 753.98 + 2261.94$

$= 3015.92 \text{ cm}^3$

Which of the following is closest to the volume of the container?

a 2261 cm^3

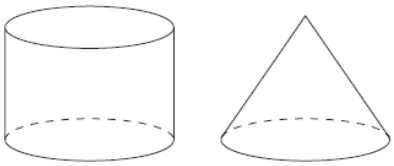
b 3016 cm^3

c 3393 cm^3

d 4524 cm^3

2013

27 The cylinder and the cone shown below have the same height and radius.



Volume of cylinder = ? × Volume of cone

What number completes this equation?

a 3

b 2

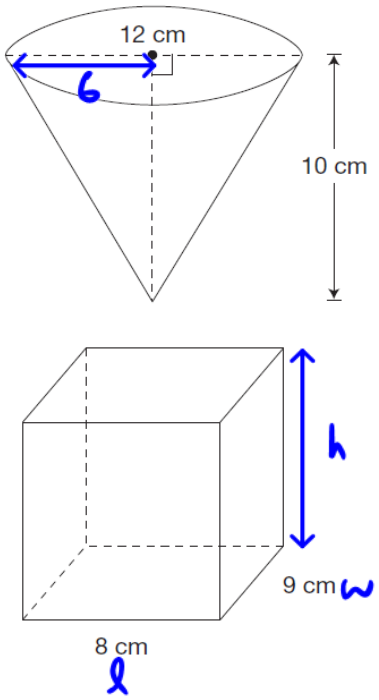
c $\frac{1}{2}$

d $\frac{1}{3}$

2018

13 What Height?

Two containers are pictured below. One container is a cone, and the other is a rectangular-based prism.



The cone is completely filled with water, and then the water is poured into the empty prism, without spilling.

Determine the height of the water in the prism.

Show your work.

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

$= \frac{\pi(6)^2(10)}{3}$

$= \frac{\pi(36)(10)}{3}$

$= \frac{\pi(360)}{3}$

$V_{cone} = 377 cm^3$

$V_{rectangular\ prism} = l \cdot w \cdot h$

$377 = (8)(9)h$

$377 = (72)h$

$\frac{377}{72} = \frac{72h}{72}$

$5.24 cm = h$

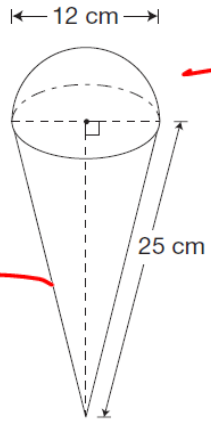
check: $V = (8)(9)(5.44)$

$= 377 cm^3$

2017

14 Don't Let It Melt!

A model of an ice cream cone made up of a cone and a hemisphere is pictured below.



The total surface area of the model will be painted at a cost of $\$0.0035/cm^2$.

Determine the total cost of painting the model.

Show your work.

CONE

$A_{lateral\ surface} = \pi rs$

$= \pi(6)(25)$

$= 471.24 cm^2$

SPHERE ($\frac{1}{2}$ a ball)

$A = 4\pi r^2$

$A = 4\pi(6)^2$

$A = 452.39$

½ SPHERE

$A = 452.16 \div 2$

$A = 226.19\ cm^2$

$A_T = 471.24 + 226.19$

$A_T = 697.43 cm^2$

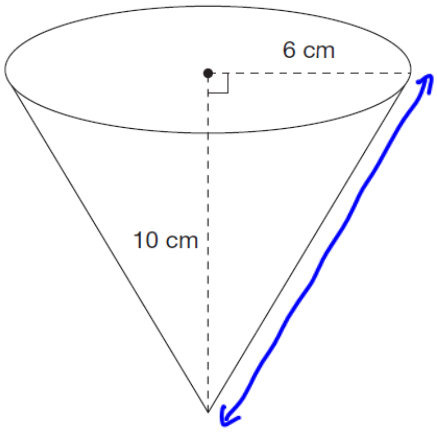
$Cost = 697.43 cm^2 \times \frac{\$0.0035}{cm^2}$

Cost = $2.44

2014

30 Coated Cones

An ice cream store offers chocolate-coated cones as shown in the diagram below.



$s^2 = a^2 + b^2$
$s^2 = 6^2 + 10^2$
$s^2 = 136$
$s = \sqrt{136}$
$s = 11.66$

The cone is open topped, and the entire outside is coated in chocolate.

Determine the area of the surface that is coated in chocolate.

Show your work.

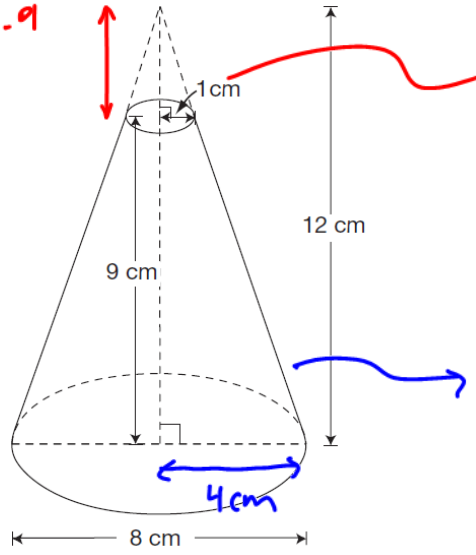
$A_{lateral\ surface} = \pi rs$
$= \pi (6)(11.66)$
$= 219.78\ cm^2$

*do not calculate the Abase as the top is open.

2013

30 Cutting Cones

The figure pictured below is a cone with its top portion removed.



Determine the volume of this figure.

Show your work.

$= 12 - 9$

$= 3$

$V_{cone\ tip} = \frac{\pi r^2 h}{3}$

$= \frac{\pi (1)^2 \times 3}{3}$

$= 3.14593\ cm^3$

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

$= \frac{\pi (4)^2 \times 12}{3}$

$= 201.0619\ cm^3$

Volume of the cone without the tip

$= 201.0619 - 3.14593$

$= 197.91597\ cm^3$