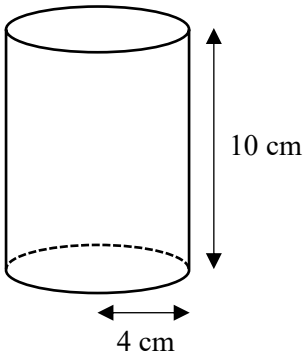
Volume and Surface Area of Cylinders

SCAN ME

REVISE THIS TOPIC

1 Here is a cylinder with a radius of 4 cm and a height of 10 cm.



(a) Work out the volume of the cylinder.
Give your answer in terms of π.

$\pi \times 4^2 \times 10$

$= \pi \times 16 \times 10$

$= 160\pi$

160π ..... cm^3

(2)

(b) Work out the surface area of the cylinder.
Give your answer in terms of π.

$2 \times \pi \times 4^2 + \pi \times 8 \times 10$

$= 2 \times \pi \times 16 + \pi \times 8 \times 10$

$= 32\pi + 80\pi$

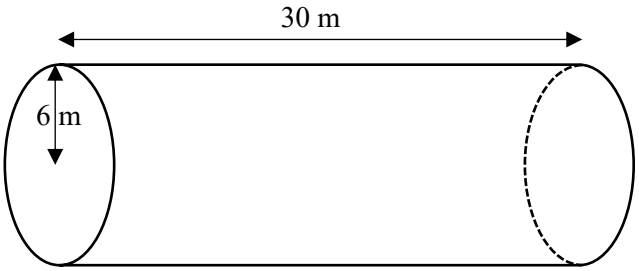
$= 112\pi$

112π ..... cm^2

(3)

(Total for Question 1 is 5 marks)

2 Here is a cylinder.



(a) Work out the volume of the cylinder.
Give your answer to 1 decimal place.

$\pi \times 6^2 \times 30 = 3392.920066$

3392.9 ..... m^3

(2)

(b) Work out the surface area of the cylinder.
Give your answer to 1 decimal place.

$2 \times \pi \times 6^2 = 226.1946711$

$\pi \times 12 \times 30 = 1130.973355$

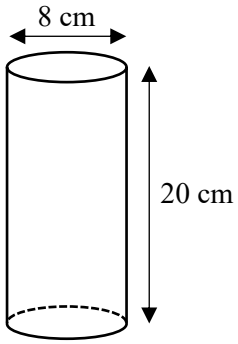
$226.19... + 1130.97... = 1357.168026$

1357.2 ..... m^2

(3)

(Total for Question 2 is 5 marks)

3 Here is a cylinder.



(a) Work out the volume of the cylinder.
Give your answer to 1 decimal place.

$\pi \times 4^2 \times 20 = 1005.309649$

1005.3 ..... cm^3

(2)

(b) Work out the surface area of the cylinder.
Give your answer to 1 decimal place.

$2 \times \pi \times 4^2 = 100.53096 49$

$\pi \times 8 \times 20 = 502.6548246$

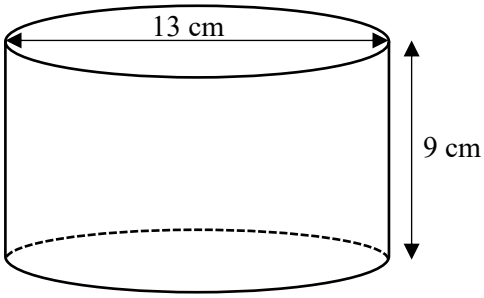
$100.53... + 502.65... = 603.1857895$

603.2 ..... cm^2

(3)

(Total for Question 3 is 5 marks)

4 Here is a cylinder.



(a) Work out the volume of the cylinder.
Give your answer to 4 significant figures.

$\pi \times 6.5^2 \times 9 = 1194.590607$

1195 ..... cm^3

(2)

(b) Work out the surface area of the cylinder.
Give your answer to 3 significant figures.

$2 \times \pi \times 6.5^2 = 265.4645792$
$\pi \times 13 \times 9 = 367.5663405$

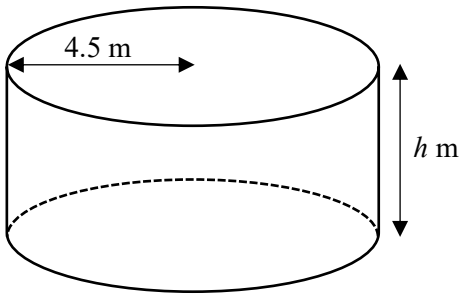
$265.46\ldots + 367.56\ldots = 633.0309197$

633 ..... cm^2

(3)

(Total for Question 4 is 5 marks)

5 Here is a cylinder with a volume of 299 m^3



(a) Work out the value of h, the height of the cylinder.
Give your answer to 1 decimal place.

$\pi \times 4.5^2 = 63.617251240$

$299 \div 63.61... = 4.699983011$

4.7

..... m

(2)

(b) Work out the surface area of the cylinder.
Give your answer to 3 significant figures.

$2 \times \pi \times 4.5^2 = 127.23...$

$\pi \times 9 \times 4.7 = 132.88...$

$127.23... + 132.88... = 260.12...$

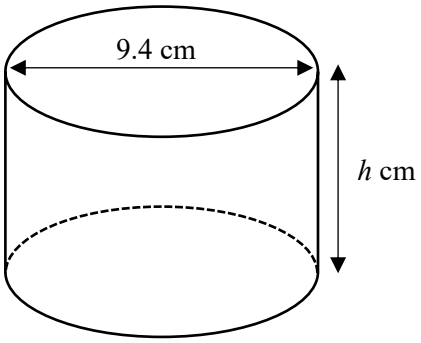
260

..... m^2

(3)

(Total for Question 5 is 5 marks)

6 Here is a cylinder with a volume of 576 cm^3



(a) Work out the value of h, the height of the cylinder.
Give your answer to 1 decimal place.

$\pi \times 4.7^2 = 69.397\,781\,72$

$576 \div 69.3\ldots = 8.299\,977\,114$

8.3 ..... cm

(2)

(b) Work out the surface area of the cylinder.
Give your answer to 4 significant figures.

$2 \times \pi \times 4.7^2 = 138.79\ldots$

$\pi \times 9.4 \times 8.3 = 245.10\ldots$

$138.79\ldots + 245.10\ldots = 383.90\ldots$

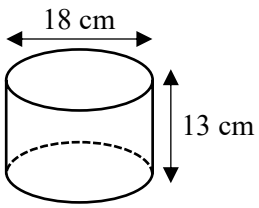
383.9 ..... cm^2

(3)

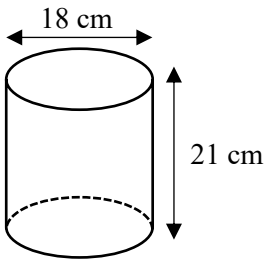
(Total for Question 6 is 5 marks)

7 Here are two cylinders.

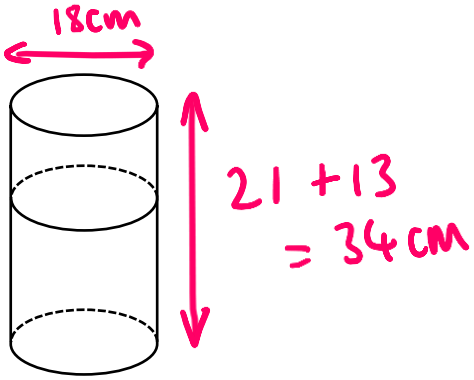
Cylinder A



Cylinder B



Cylinder A is placed on top of **cylinder B** to form a new cylinder.



Work out the surface area of the new cylinder.
Give your answer to 4 significant figures.

$2 \times \pi \times 9^2 = 508.9380099$

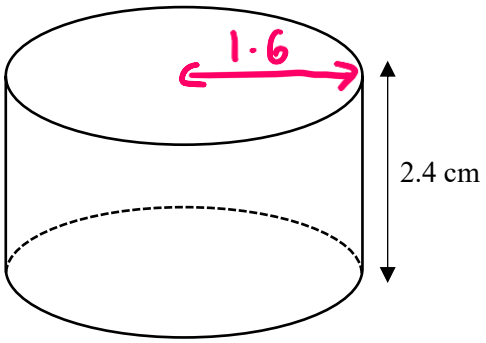
$\pi \times 18 \times 34 = 1922.654704$

$508.9... + 1922.6... = 2431.59...$

2432 ..... cm^2

(Total for Question 7 is 3 marks)

8 Here is a cylinder with a height of 2.4 cm



The ratio of the radius of the cylinder to the height of the cylinder is 2 : 3

(a) Work out the volume of the cylinder.
Give your answer to 1 decimal place.

$2.4 \div 3 = 0.8$
$0.8 \times 2 = 1.6$

$\pi \times 1.6^2 \times 2.4 = 19.301945 26$

19.3 ..... cm^3

(3)

(b) Work out the surface area of the cylinder.
Give your answer to 3 significant figures.

$2 \times \pi \times 1.6^2 = 16.08495439$
$\pi \times 3.2 \times 2.4 = 24.12743158$

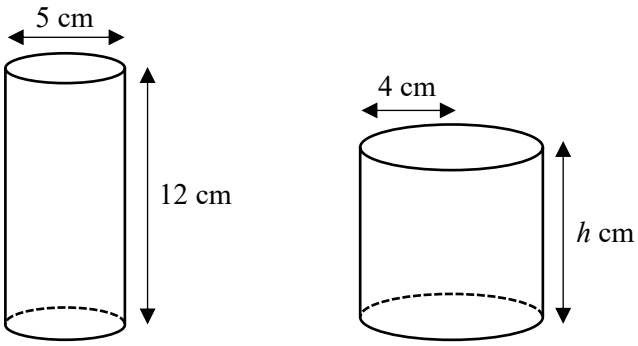
$16.08... + 24.12... = 40.21238597$

40.2 ..... cm^2

(3)

(Total for Question 8 is 6 marks)

9 Here are two cylinders with the same volume.



Work out the value of h, the height of the second cylinder.
Give your answer to 2 decimal places.

$\pi \times 2.5^2 \times 12 = 235.619449$

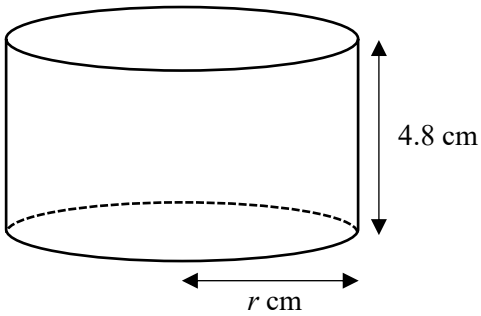
$\pi \times 4^2 = 50.26548246$

$235.61... \div 50.26... = 4.6875$

4.69 ..... cm

(Total for Question 9 is 4 marks)

10 Here is a cylinder with a volume of 266 cm^3



(a) Work out the value of r, the radius of the cylinder.
Give your answer to 1 decimal place.

$\pi \times r^2 \times 4.8 = 266$

$r^2 = 266 \div 4.8\pi$

$r^2 = 17.639\,672\,86$

$r = \sqrt{17.639\ldots}$

4.2 ..... cm

(3)

(b) Work out the surface area of the cylinder.
Give your answer to 4 significant figures.

$2 \times \pi \times 4.2^2 = 110.83\ldots$

$\pi \times 8.4 \times 4.8 = 126.66\ldots$

$110.83\ldots + 126.66\ldots = 237.50\ldots$

237.5 ..... cm^2

(3)

(Total for Question 10 is 6 marks)