Name:

Exam Style Questions

Volume of a Cylinder

Corbettmaths

Equipment needed: Calculator, pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

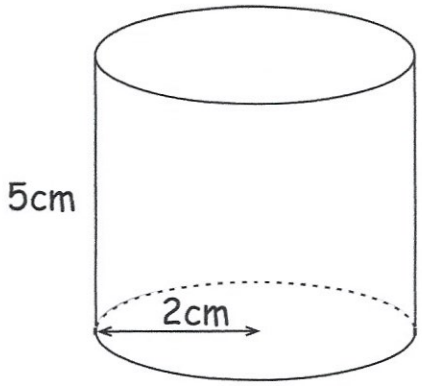
Video Tutorial

www.corbettmaths.com/contents

Video 357

Answers and Video Solutions

1. Below is a cylinder with radius 2cm and height 5cm.



Calculate the volume of the cylinder.

$V = \pi \times r^2 \times h$

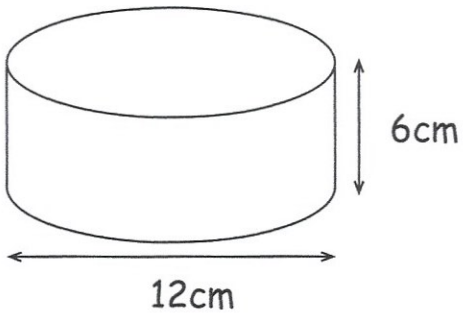
$= \pi \times 2^2 \times 5$

$= 62.8318...$ (20π)

62.83 cm³

(3)

2. Shown below is a cylinder.



Calculate the volume.
Give your answer to 1 decimal place.

$V = \pi \times r^2 \times h$

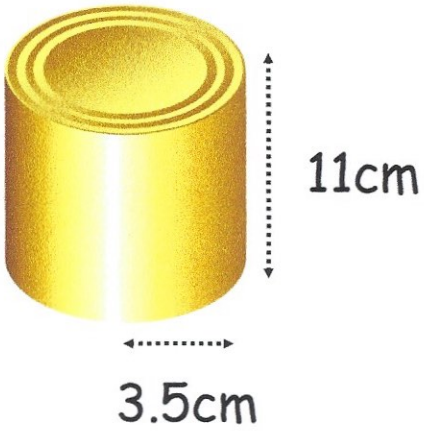
$= \pi \times 6^2 \times 6$

$= 678.584...$ (216π)

678.6 cm³

(3)

3. A can of baked beans is shown below.



Calculate the volume of the can.

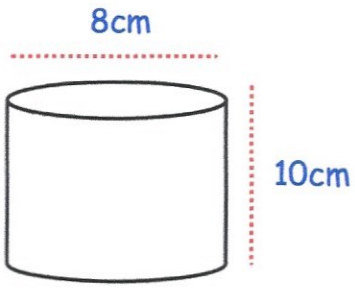
$V = \pi \times 3.5^2 \times 11$

$= 423.3296...$

423.33 ..... cm^3

(3)

4. Below is a cylinder with diameter 8cm and 10cm.



Find the volume of the cylinder.
Give your answer in terms of π

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

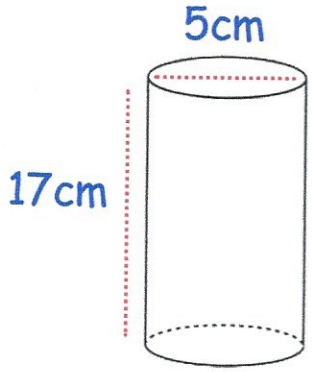
$= \pi \times 16 \times 10$

$= 160\pi$

160π ..... cm^3

(3)

5. Shown below is a cylinder with diameter 5cm and height 17cm.



Calculate the volume of the cylinder.
Give your answer to 1 decimal place.

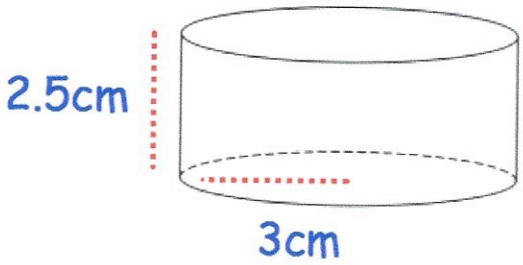
$V = \pi \times 2.5^2 \times 17$

$= 333.7902\ldots$

333.8 ..... cm^3

(3)

6.



Calculate the volume of the cylinder.
Give your answer in terms of π
State the units of your answer.

$V = \pi \times 3^2 \times 2.5$

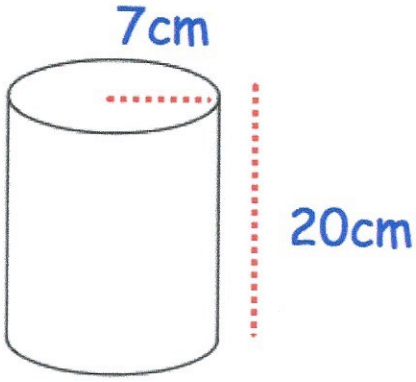
$= \pi \times 9 \times 2.5$

$= 22.5\pi$

$22.5\pi\ cm^3$ .....

(4)

7. Carl is filling flowerpots with soil.



Each flowerpot is a cylinder with radius 7cm and height 20cm.
Carl has 50 litres of soil.

1 Litre = $1000cm^3$

How many flowerpots can be filled?

$V = \pi \times 7^2 \times 20$

$= 3078.760801...$ (980π)

$50000 \div 3078.7608...$

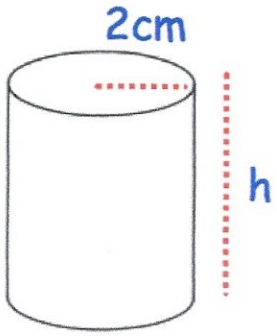
$= 16.24...$

16

.....

(4)

8. A cylinder has radius 2cm.



The volume of the cylinder is 100cm³
Calculate the height of the cylinder.

$V = \pi \times 2^2 \times h$

$100 = \pi \times 4 \times h$

$\div 4 \quad \div 4$

$25 = \pi \times h$

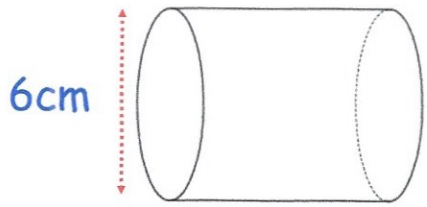
$\div \pi \quad \div \pi$

$7.9577... = h$

7.958 cm

(3)

9. The cylinder below has a diameter of 6cm



The volume of the cylinder is 180π cm³

Work out the length of the cylinder.

$\pi \times 3^2 \times L = 180\pi$

$\pi \times 9 \times L = 180\pi$

$\div \pi \quad \div \pi$

$9 \times L = 180$

$\div 9 \quad \div 9$

$L = 20$

20 cm

(3)

10. A cylinder has a height of 15cm and a volume of 500cm³
Calculate the radius of the cylinder.

$V = \pi \times r^2 \times h$

$500 = \pi \times r^2 \times 15$

$\div \pi \quad \div \pi$

$159.1549... = r^2 \times 15$

$\div 15 \quad \div 15$

$10.61... = r^2$

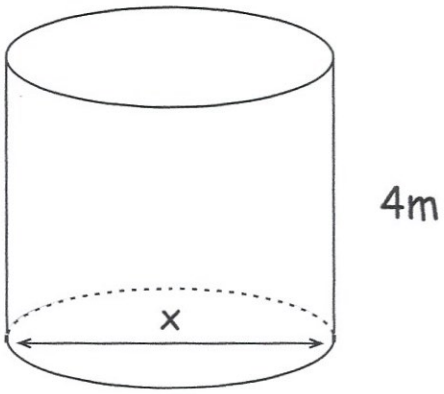
$r = \sqrt{10.61...}$

$r = 3.2573...$

3.257 ..... cm

(3)

11. A shown below is a cylindrical water tank.
The height of the tank is 4 metres.



The volume of the tank is 6.4m³

Find the diameter of the water tank.

$V = \pi \times r^2 \times h$

$6.4 = \pi \times r^2 \times 4$

$\div 4 \quad \div 4$

$1.6 = \pi \times r^2$

$\div \pi \quad \div \pi$

$0.50929... = r^2$

$r = \sqrt{0.5092...}$

$r = 0.71364...$

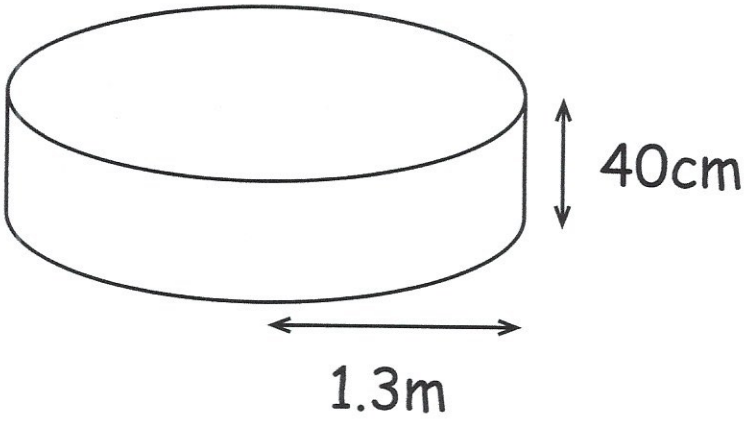
$0.71364... \times 2$

$x = 1.427$

1.427 ..... m

(3)

12. Shown below is a paddling pool with radius 1.3m and depth 40cm



Felix is filling the padding pool at a rate of 15 litres a minute.

1 litre = $1000 cm^3$

Work out how long it takes to fill the paddling pool.
Give your answer to the nearest minute.

$15000 cm^3$ per minute.

$V = \pi \times r^2 \times d$

$V = \pi \times 130^2 \times 40$

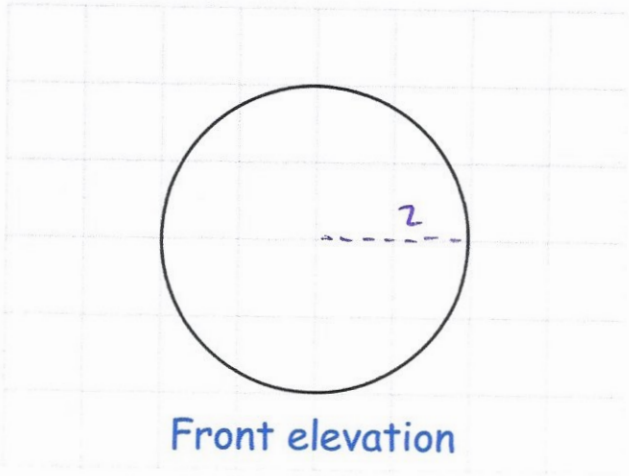
$= 2123716.634 cm^3$

$212716.634 \div 15000 = 141.5811089$

142 ..... minutes

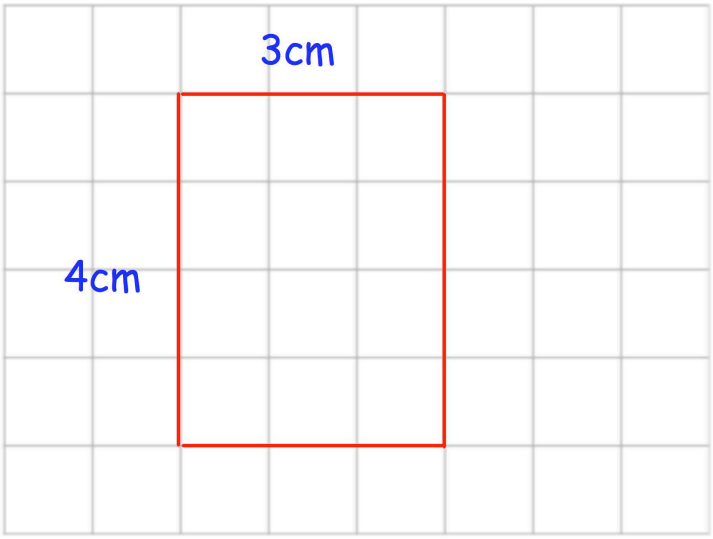
(4)

13. Here is the front elevation of a cylinder on a centimetre square grid.



The volume of the cylinder is 12π cm^3

Draw the side elevation of the cylinder.



$V = \pi \times r^2 \times h$

$= \pi \times 2^2 \times h$

$12\pi = 4\pi h$

$\div \pi \quad \div \pi$

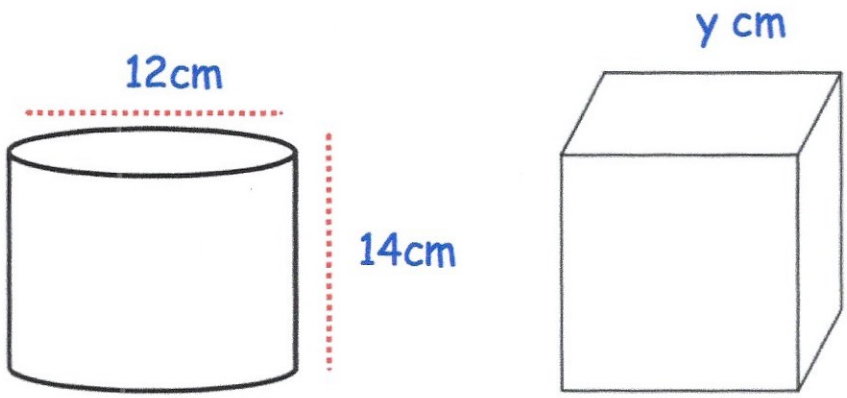
$12 = 4h$

$\div 4 \quad \div 4$

$3 = h$

(4)

14.



A cylinder has diameter 12cm and height 14cm.
A cube has side length y cm.
The cylinder and cube has the same volume.

Find y.

$V = \pi \times r^2 \times h$

$= \pi \times 6^2 \times 14$

$= 1583.3626... \ (504\pi) \ cm^3$

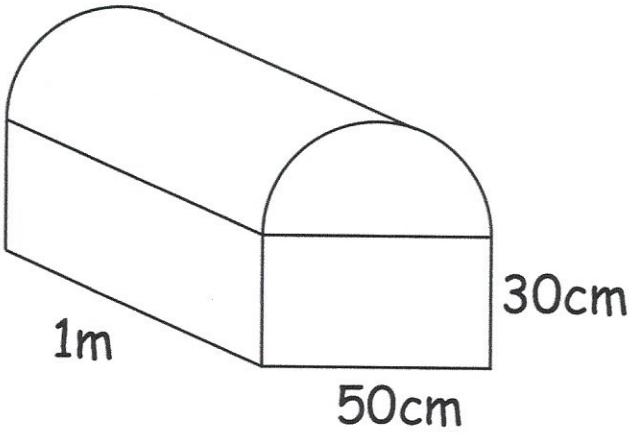
$\sqrt[3]{1583.3626...}$

$y = 11.655...$

11.655 ..... cm

(4)

15.



Shown above is a prism that is 1m long.

The cross-section of the prism is a semi-circle above a rectangle.

Calculate the volume of the prism.
Give your answer correct to 1 decimal place.

volume of cuboid = $100 \times 50 \times 30 = 150000 cm^3$

volume of top = $\frac{1}{2} \times \pi \times 25^2 \times 100 = 98174.77... cm^3$

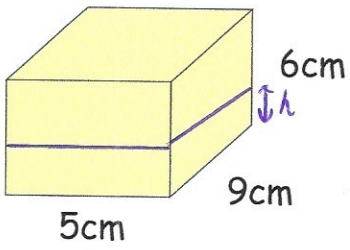
$+$

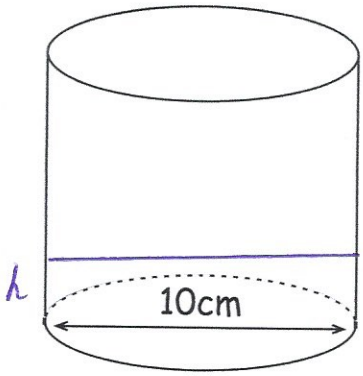
248174.8 to 1dp.

248174.8 ..... cm^3

(4)

16.





A cuboid is full of liquid.

Some of the liquid is poured from the cuboid into the cylinder.
The height, h, of the liquid in both containers is the same.

Work out h.

$V = 5 \times 9 \times 6 = 270 cm^3$ (total volume of liquid)

Let h be the height of liquid in the cuboid & cylinder.

$(5 \times 9 \times h) + (\pi \times 5^2 \times h) = 270$

$45h + 25\pi h = 270$

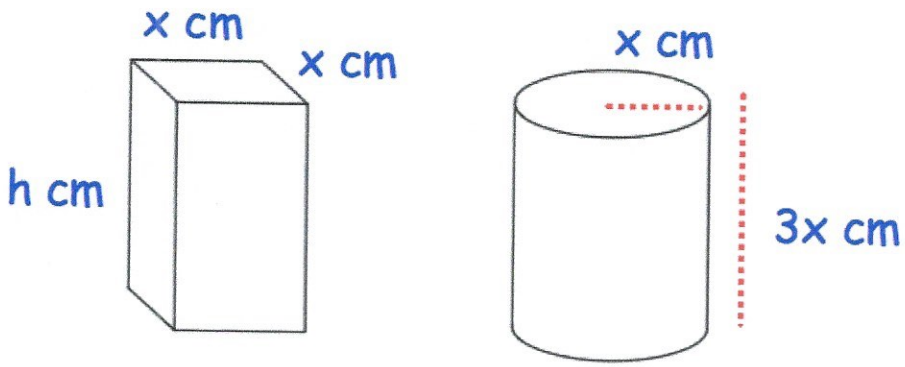
$123.5398... h = 270$

$h = 2.1855$

2.1855 ..... cm

(4)

17.



The volume of the cuboid and the cylinder are equal.

Find h in terms of x.
Give your answer in its simplest form.

$V = l \times w \times h$

$V = x \times x \times h$

$V = x^2 h$

$V = \pi \times (x)^2 \times (3x)$

$V = \pi \times (x^2) \times (3x)$

$V = 3x^3 \times \pi$

$V = 3\pi x^3$

$x^2 h = 3\pi x^3$

$h = 3\pi x$

$3\pi x$ ..... cm

(3)