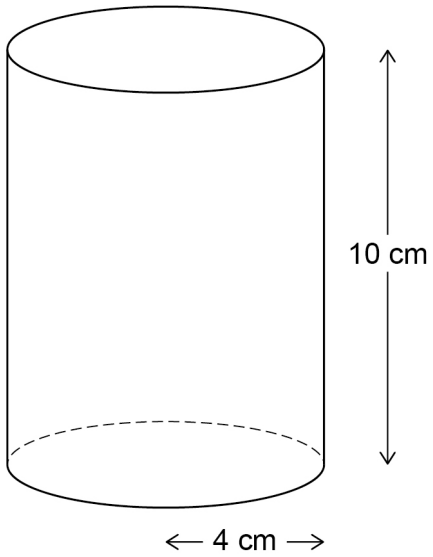
**1** Here are two solids.

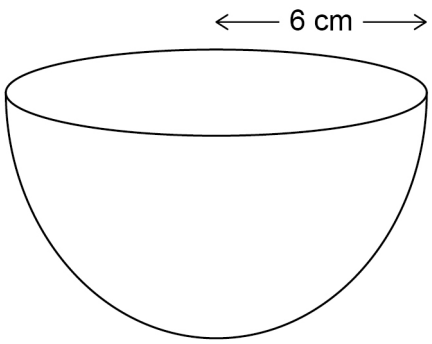
**Cylinder**

radius 4 cm height 10 cm




**Hemisphere**

radius 6 cm




| |
|---|
| volume of a hemisphere $= \frac{2}{3}\pi r^3$ where $r$ is the radius |

Which solid has the greater volume?

You **must** show your working.

**[4 marks]**

Volume of cylinder : $\pi \times 4^2 \times 10$

$= 160\pi$ (1)

Volume of a hemisphere : $\frac{2}{3} \times \pi \times 6^3$ (1)

$= \frac{2}{3}(216) \times \pi$

$= 144\pi$ (1)

Answer cylinder (1)

**2** A quadrilateral *PQRS* has

*PQ* = 5 cm

*QR* perpendicular to *PQ*

*QR* = 7 cm

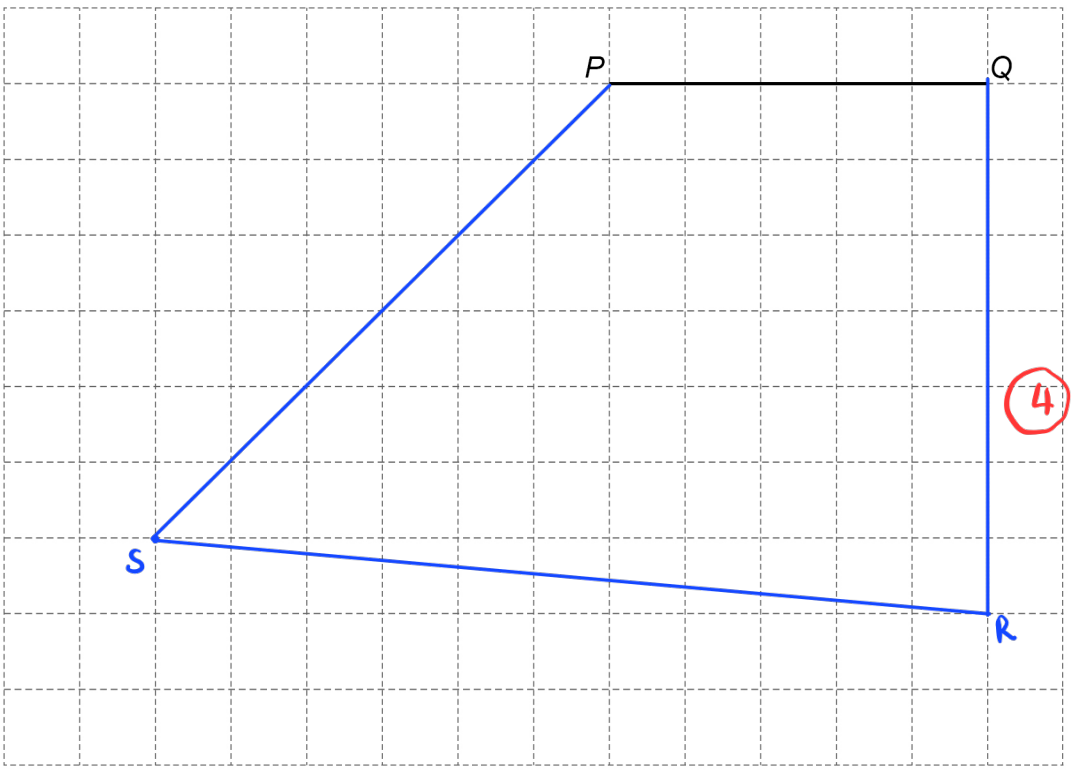
angle *QPS* = 135°

*PS* = 8.5 cm

On the grid, draw the quadrilateral *PQRS*.

*PQ* has been drawn for you.

**[4 marks]**



**3** Circle the solid that has six vertices.

**[1 mark]**

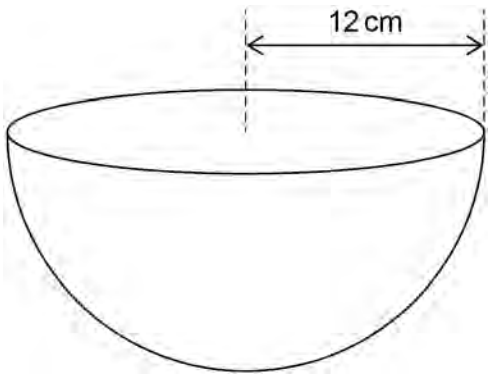
cone cuboid triangular prism square-based pyramid

(1)

**4**

Volume of a sphere = $\frac{4}{3}\pi r^3$

A bowl is a hemisphere with radius 12 cm




Water is poured into the bowl

at a rate of 325 $cm^3$ per second

for 8 seconds.

Does the water fill **more than** 70% of the bowl?

You **must** show your working.

**[4 marks]**

Volume of water = 325 × 8 = 2600 (1)

volume of hemisphere = $\frac{1}{2} \times \frac{4}{3} \times \pi \times 12^3$

= 3620 (1)

$\frac{2600}{3620} \times 100\% = 71.8\%$ (1)

(1)

Yes. The water fills 71.8% of the bowl.

**5** Circle the solid that has six edges.

**[1 mark]**

triangular-based pyramid

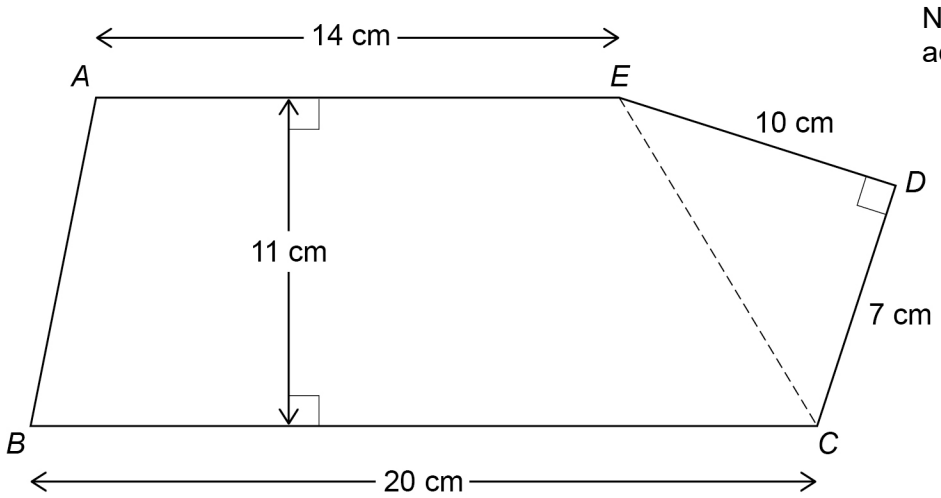
sphere

cube

cylinder

1

**6** *ABCDE* is a pentagon.




Not drawn accurately

Work out the area of the pentagon.

**[3 marks]**

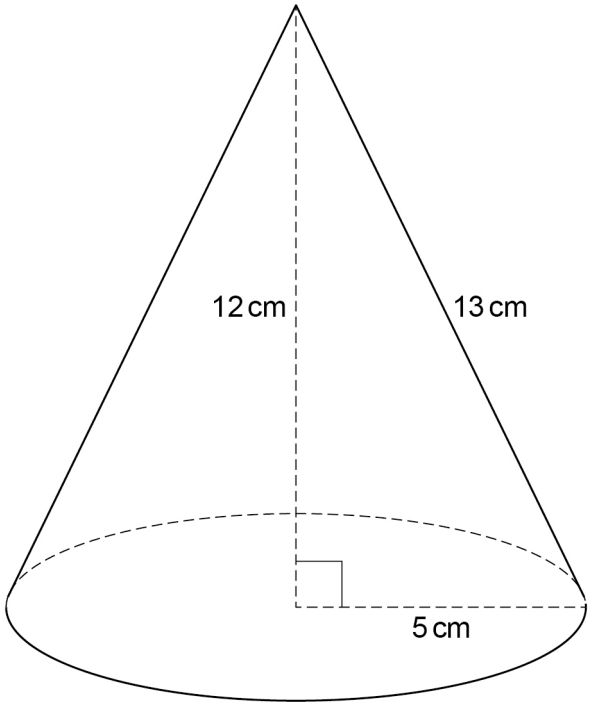
Area of trapezium : $\frac{1}{2} \times (14+20) \times 11 = 187 \text{ cm}^2$ (1)

Area of triangle : $\frac{1}{2} \times 10 \times 7 = 35 \text{ cm}^2$ (1)

Total area : $187 + 35 = 222 \text{ cm}^2$ (1)

Answer 222 $\text{cm}^2$

**7** Here is a cone.




**7 (a)**

| |
|---|
| Curved surface area of a cone $= \pi rl$<br>where $r$ is the radius and $l$ is the slant height |

Beth tries to work out the curved surface area in terms of $\pi$

| |
|---|
| Curved surface area of the cone $= \pi \times 5 \times 12$<br>$= 60\pi \text{ cm}^2$ |

What mistake has she made?

**[1 mark]**

The value of l should be 13 instead of 12 ✓ (1)

**7 (b)** Adam uses $\pi = 3$ to estimate the area of the **base** of the cone.

Work out his estimate.

**[2 marks]**

Area of the base of the cone = $\pi \times r^2$

$= 3 \times 5^2$

$= 3 \times 25$ ✓1

$= 75\ cm^2$ ✓1

Answer 75 $cm^2$

**7 (c)** Beth uses $\pi = 3.14$ to estimate the area of the **base** of the cone.

Is Beth's estimate more than or less than Adam's estimate?

Tick a box.

More than [✓] Less than [ ]

Give a reason for your answer.

**[1 mark]**

3.14 is larger than 3. ✓1