Volume and Surface Area of Cones - Worksheet

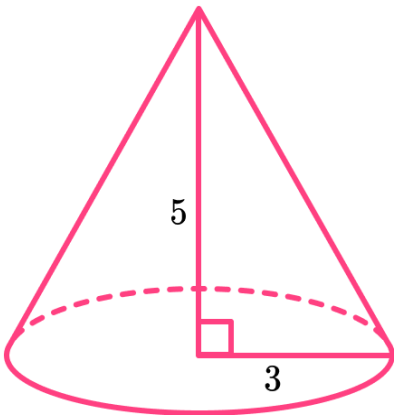
Skill

Group A - volume of a cone

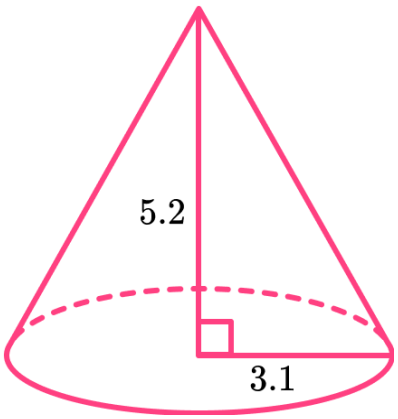
Work out the volume of the cone. All dimensions are in cm.

Diagrams are NOT to scale. Give your answer correct to 3 sf:

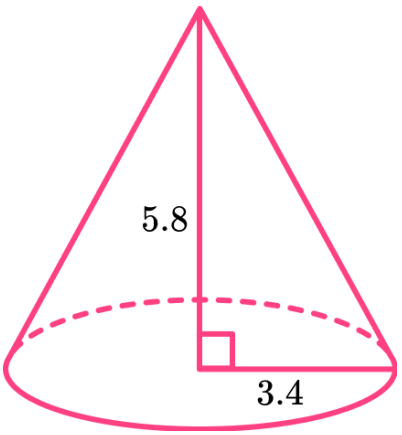
1)



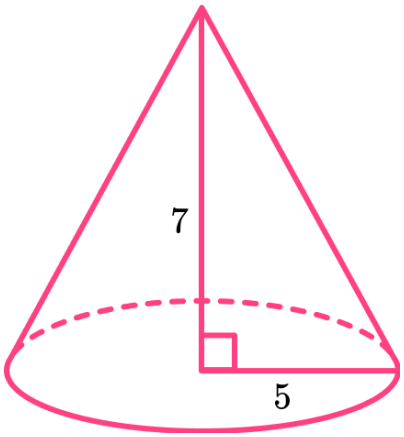
2)



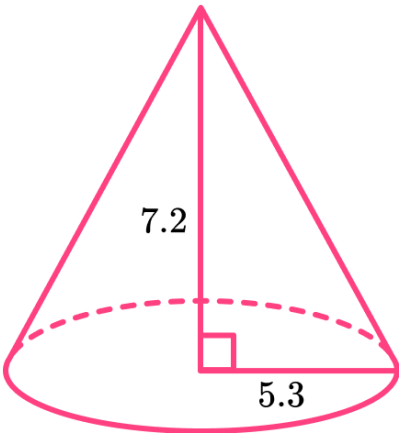
3)



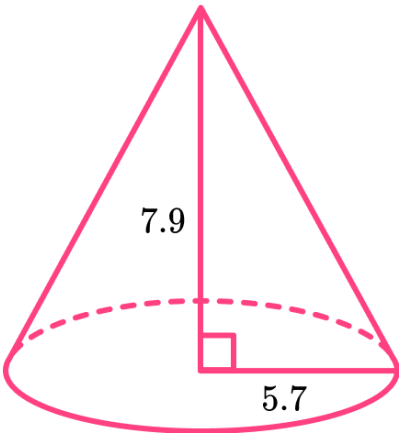
4)



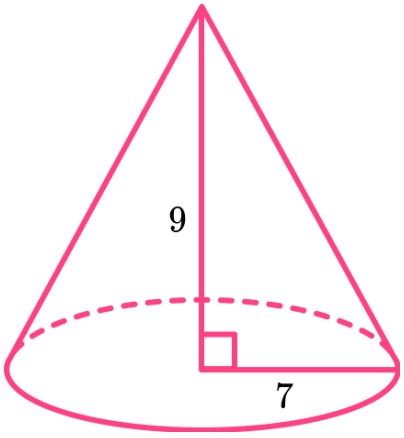
5)



6)



7)



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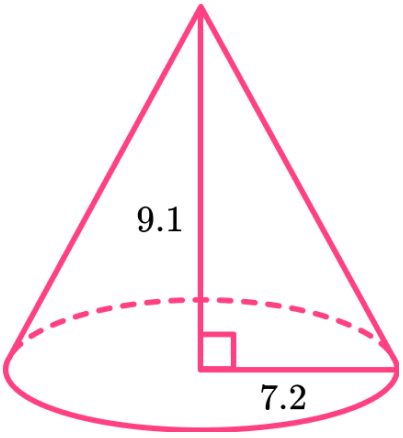
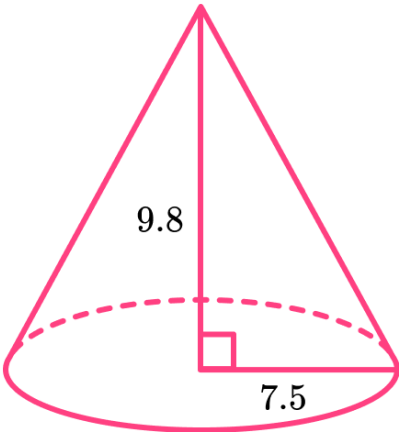


9)

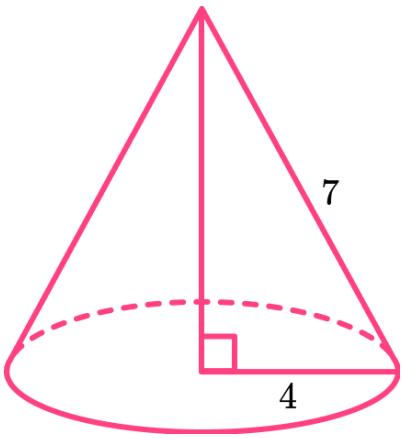


Group B - curved surface area of a cone

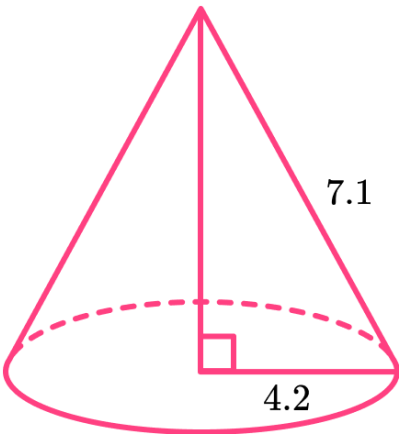
Work out the curved surface area of the cone. All dimensions are in cm.

Diagrams are NOT to scale. Give your answer correct to 3 sf:

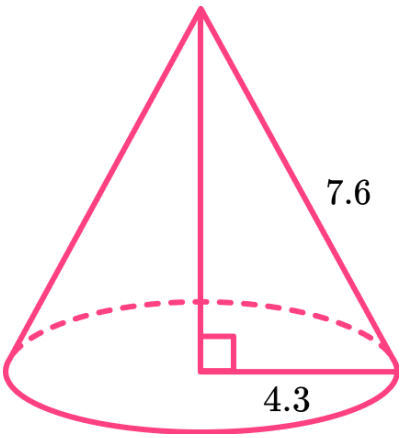
1)



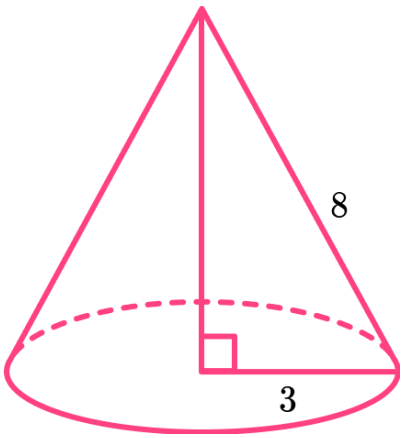
2)



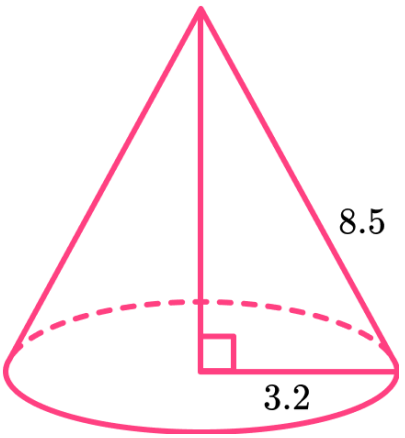
3)



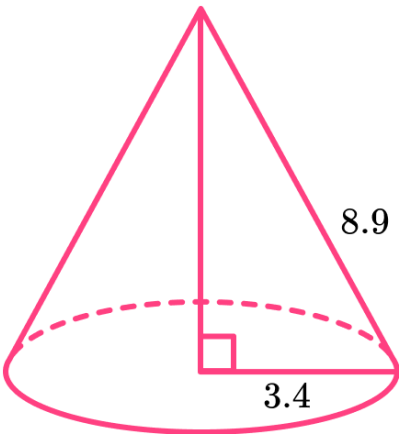
4)



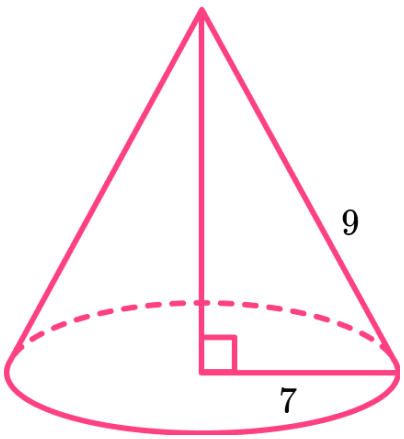
5)



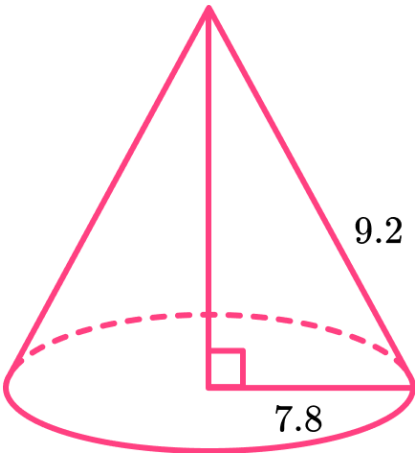
6)



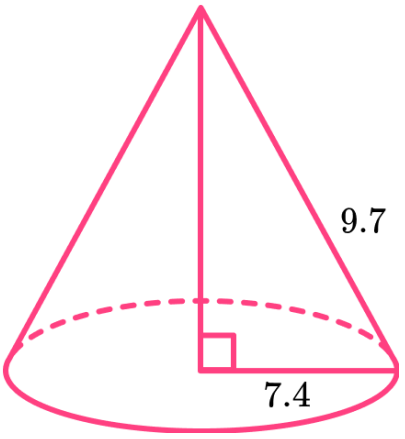
7)



8)



9)

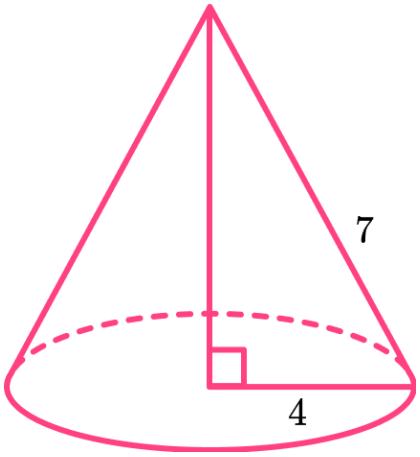


Group C - TOTAL surface area of a cone

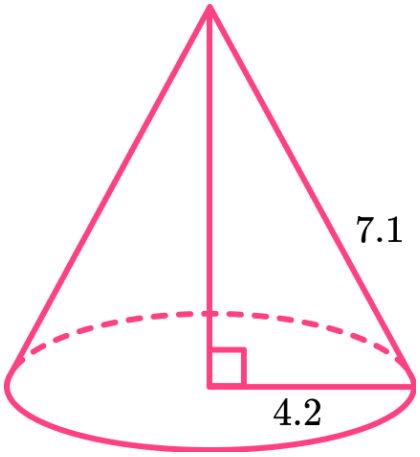
Work out the TOTAL surface area of the cone. All dimensions are in cm.

Diagrams are NOT to scale. Give your answer correct to 3 sf:

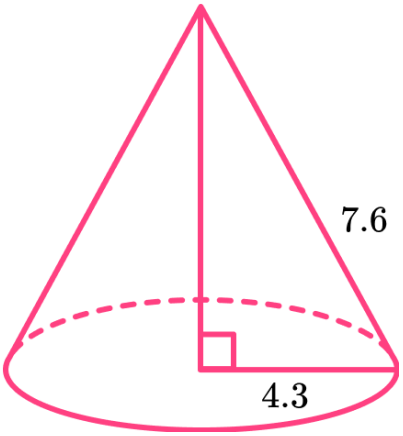
1)



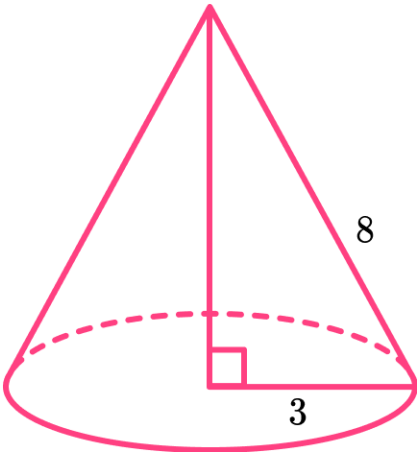
2)



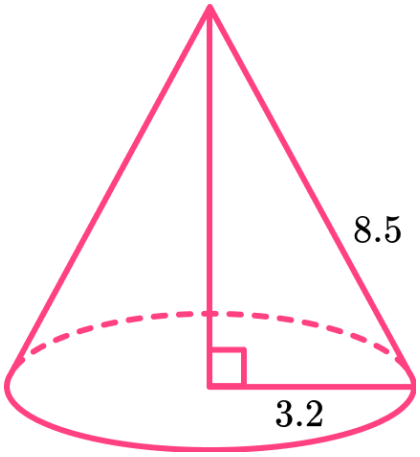
3)



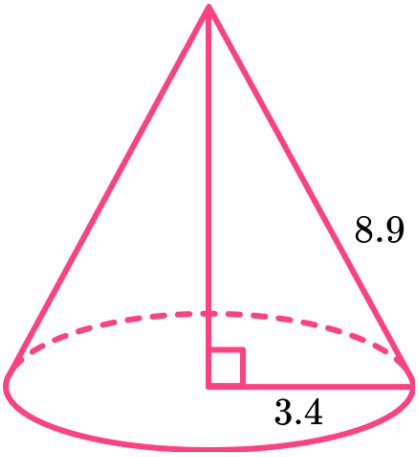
4)



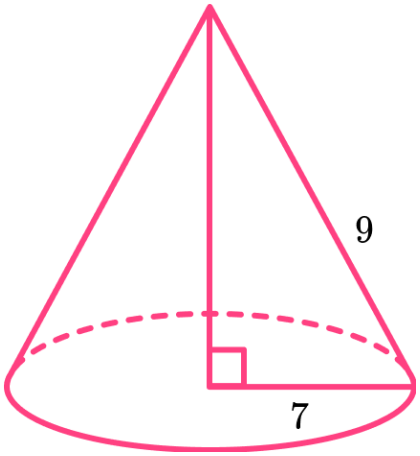
5)



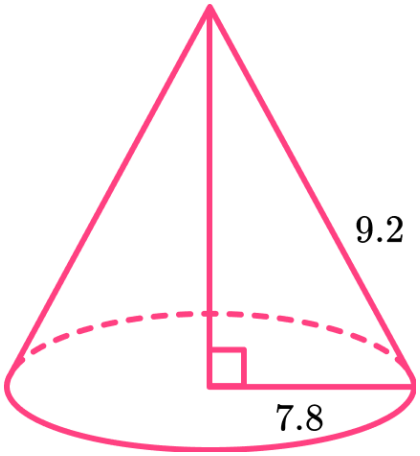
6)



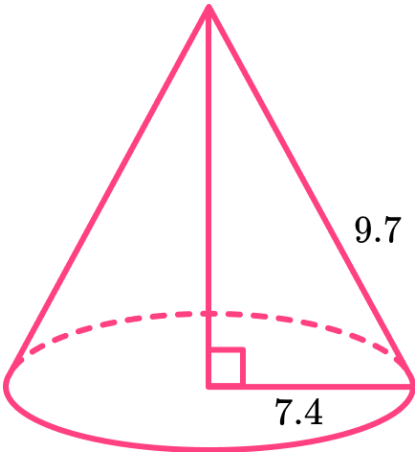
7)



8)



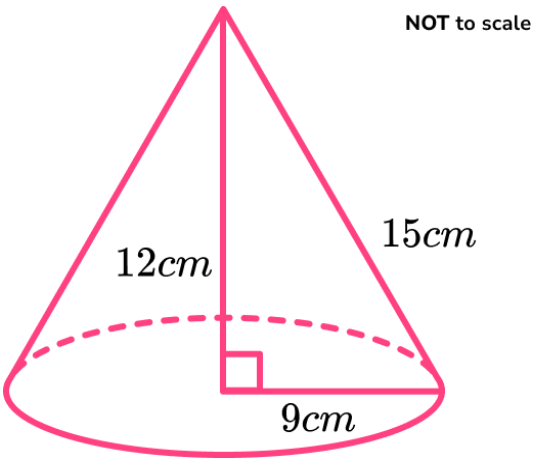
9)



Volume and Surface Area of Cones - Worksheet

Applied

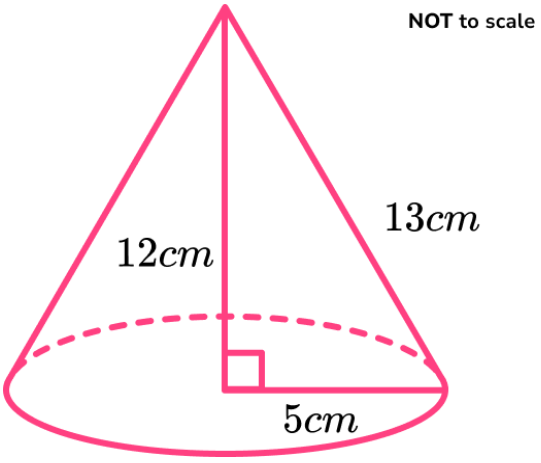
1) **(a)** Here is a cone.



Work out its volume.
Give your answer to 3 significant figures.

(b) Work out its total surface area.
Give your answer to 3 significant figures.

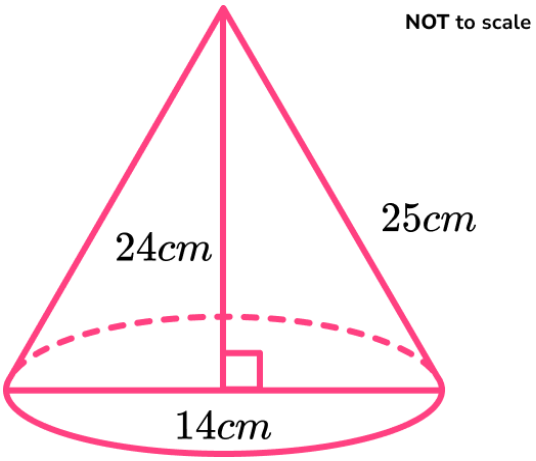
2) **(a)** Here is a cone.



Work out its volume.
Leave your answer in terms of π.

(b) Work out its total surface area.
Leave your answer in terms of π.

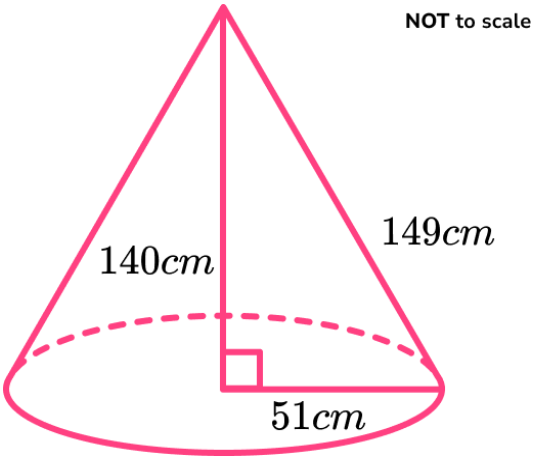
3) **(a)** Here is a cone.



Work out its volume.
Give your answer to 3 significant figures.

(b) Work out its total surface area.
Give your answer to 3 significant figures.

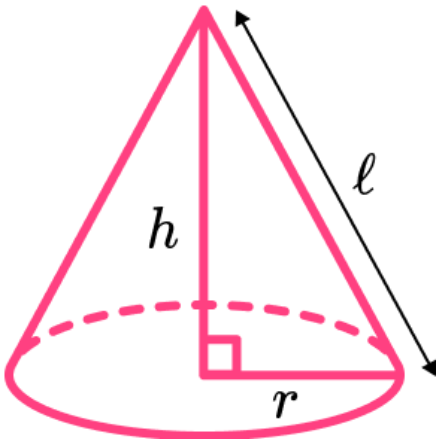
4) **(a)** Here is a cone.



Work out its volume.
Give your answer in terms of m^3 to 3 significant figures.

(b) Work out its total surface area.
Give your answer in terms of m^2 to 3 significant figures.

Volume and Surface Area of Cones - Exam Questions



$Volume\ of\ a\ cone = \frac{1}{3}\pi r^2 h$

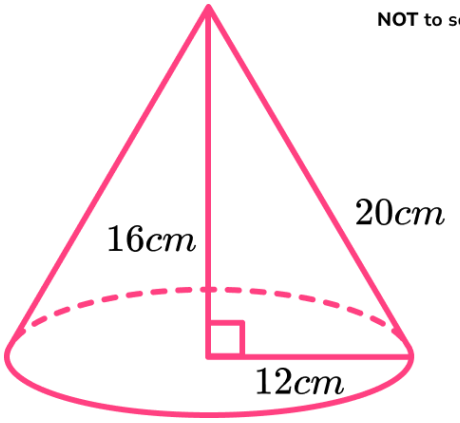
$Curved\ surface\ area\ of\ a\ cone = \pi rl$

1) Here is a cone.

Calculate the volume of the cone.

Give your answer to 3 significant figures.

NOT to scale



.....cm^3

(2 marks)

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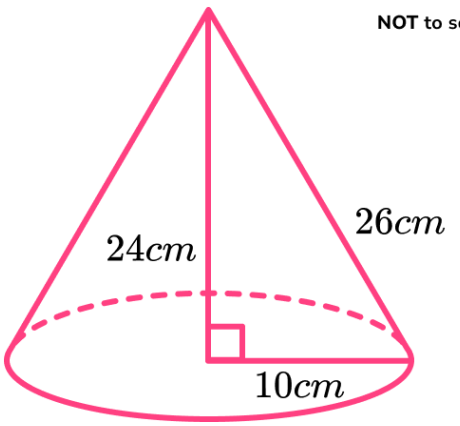
2) Here is a cone.

Calculate the TOTAL surface area of the cone.

Give your answer to 3 significant figures.

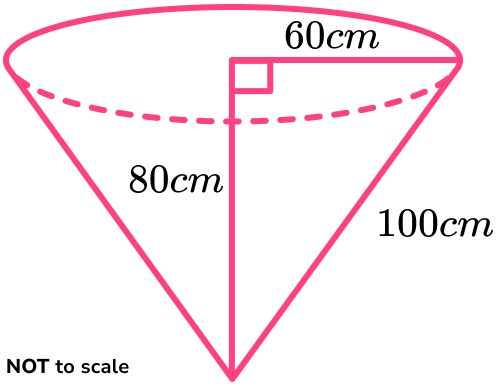
NOT to scale



.....cm^2

(3 marks)

3) A container is a cone of radius $60cm$, perpendicular height $80cm$ and slant height $100cm$.



NOT to scale

Water fills the container at a rate of 12 $litres$ per minute.

How long does it take to fill the container?

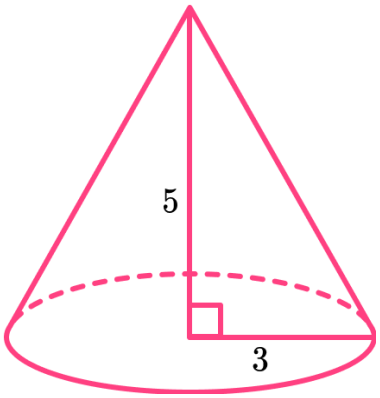
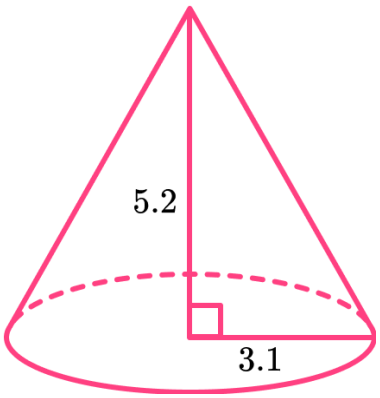
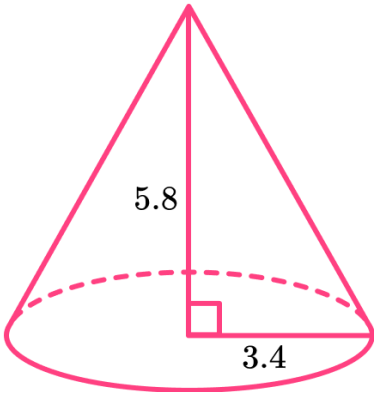
Give your answer to the nearest minute.

$(1\ litre\ =\ 1000cm^2)$

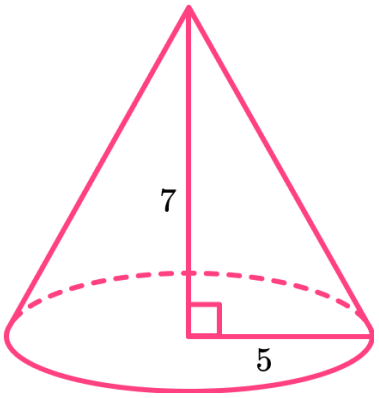
.....minutes

(4 marks)

Volume and Surface Area of Cones - Answers

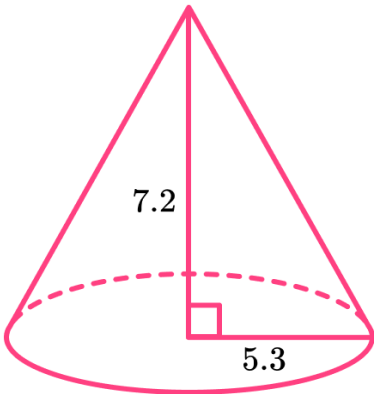
	Question	Answer
	Skill Questions	
	Work out the volume of the cone. All dimensions are in cm. Diagrams are NOT to scale. Give your answer correct to 3 sf:	
Group A	**1)**  **2)**  **3)**  	**1)** $47.1\ cm^3$ **2)** $52.3\ cm^3$ **3)** $70.2\ cm^3$

4)



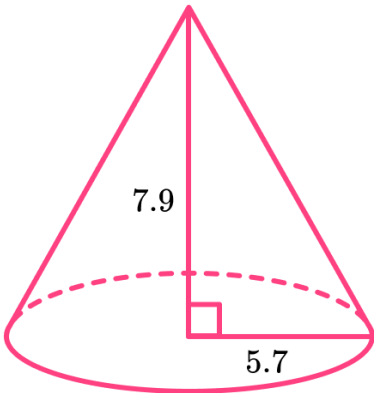
4) $183\ cm^3$

5)



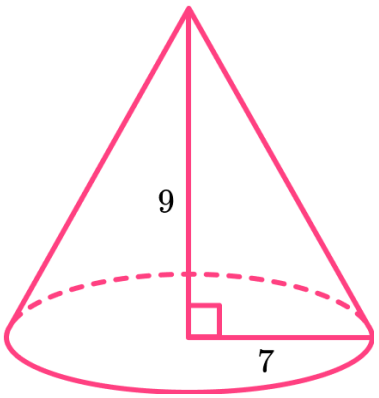
5) $212\ cm^3$

6)

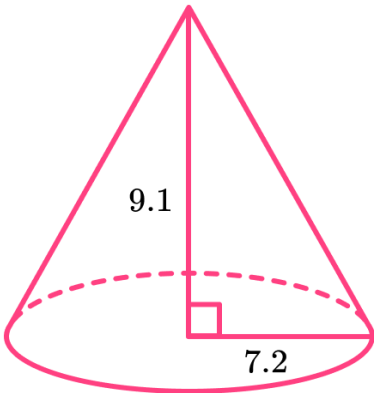
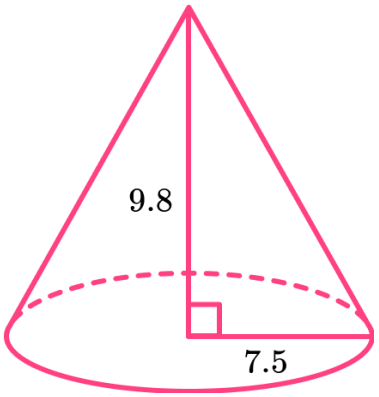
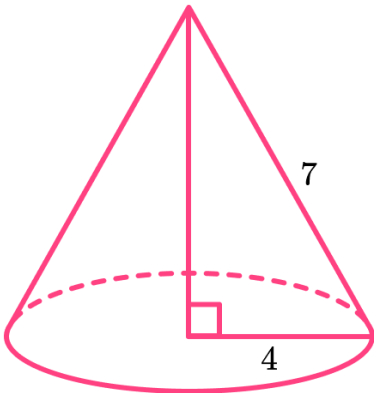
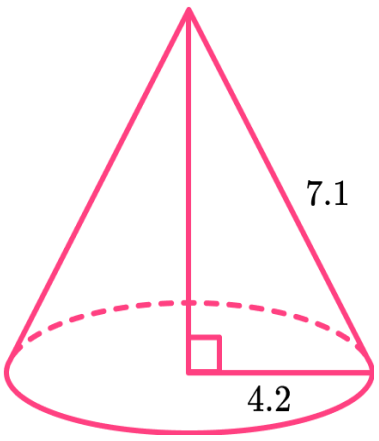


6) $269\ cm^3$

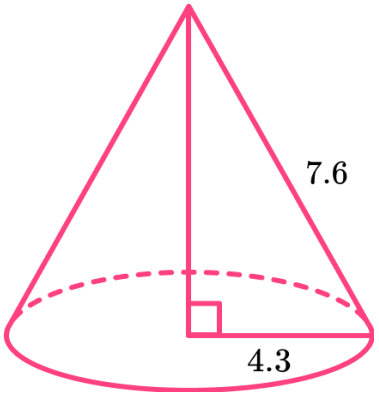
7)



7) $462\ cm^3$

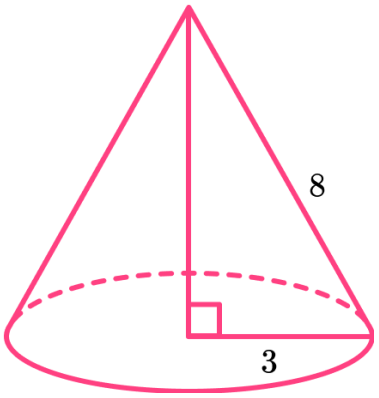
	8)  **9)**  	**8)** $494\ cm^3$ **9)** $577\ cm^3$
	Work out the curved surface area of the cone. All dimensions are in cm. Diagrams are NOT to scale. Give your answer correct to 3 sf:	
Group B	**1)**  **2)**  	**1)** $88.0\ cm^2$ **2)** $93.7\ cm^2$

3)



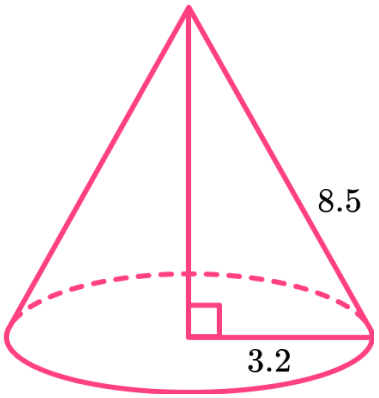
3) $103\ cm^2$

4)



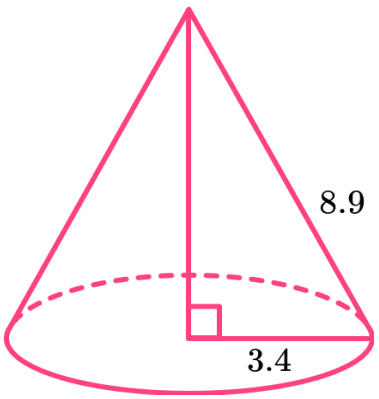
4) $75.4\ cm^2$

5)

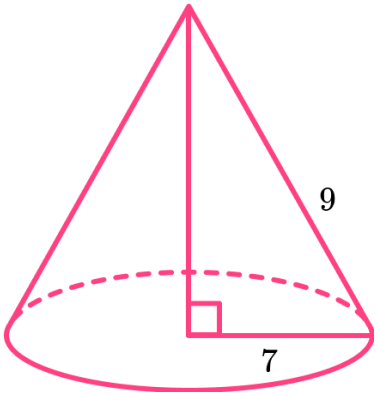
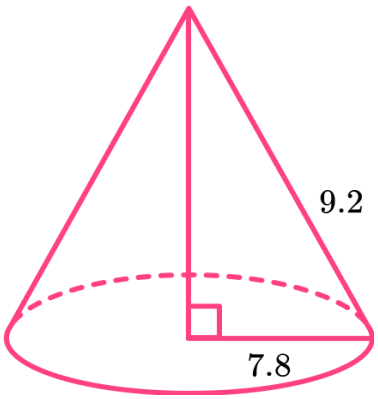
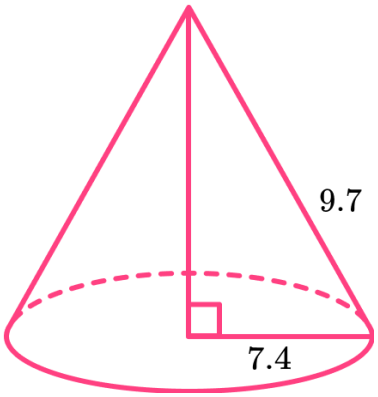
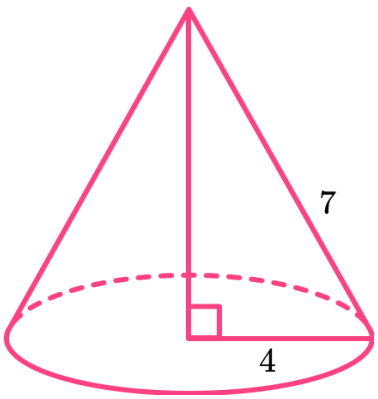


5) $85.5\ cm^2$

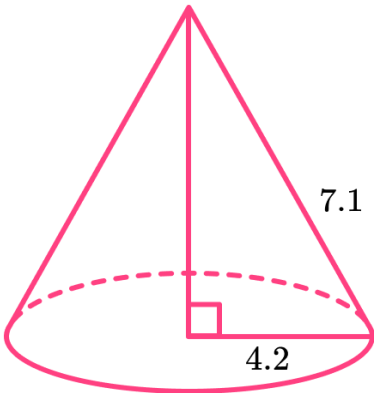
6)



6) $95.1\ cm^2$

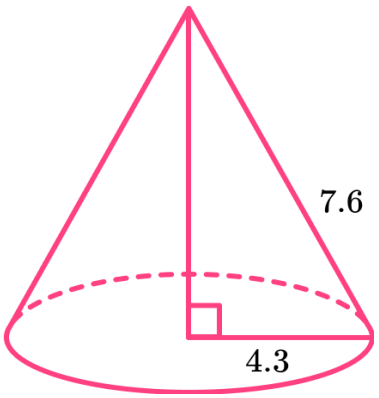
	7)  **8)**  **9)**  	**7)** $198\ cm^2$ **8)** $225\ cm^2$ **9)** $226\ cm^2$
	Work out the TOTAL surface area of the cone. All dimensions are in cm. Diagrams are NOT to scale. Give your answer correct to 3 sf:	
Group C	**1)**  	**1)** $138\ cm^2$

2)



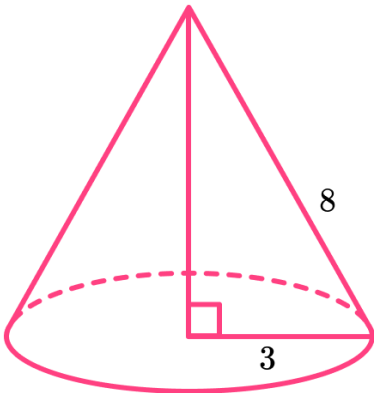
2) $149\ cm^2$

3)



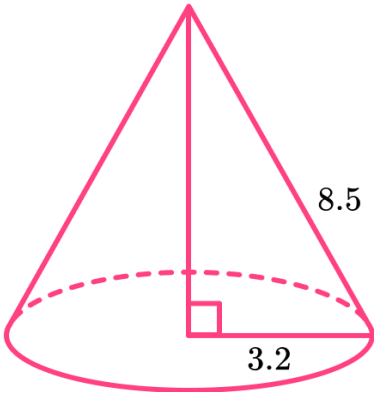
3) $161\ cm^2$

4)

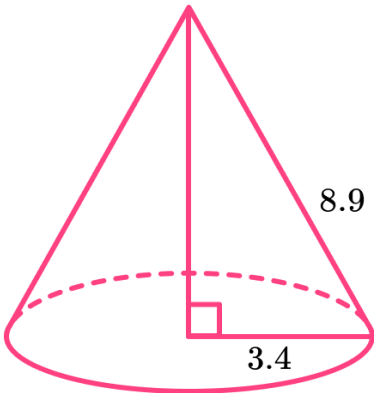
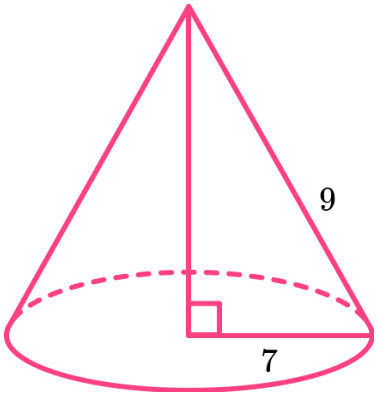
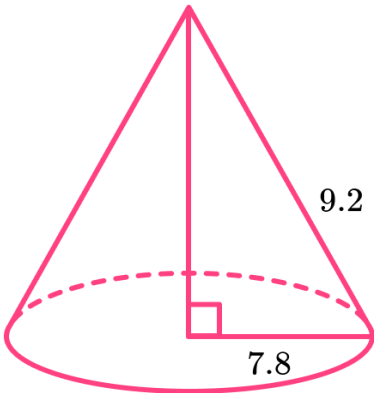
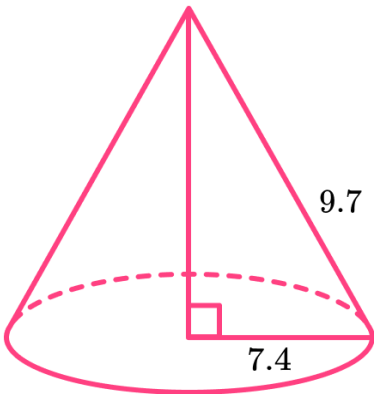


4) $104\ cm^2$

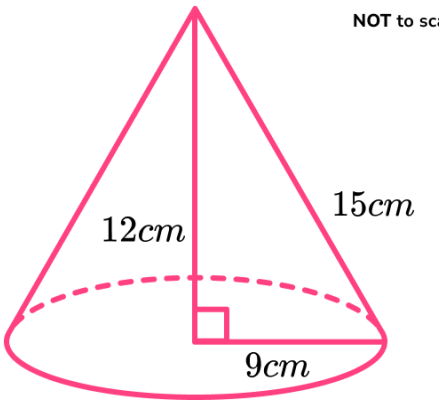
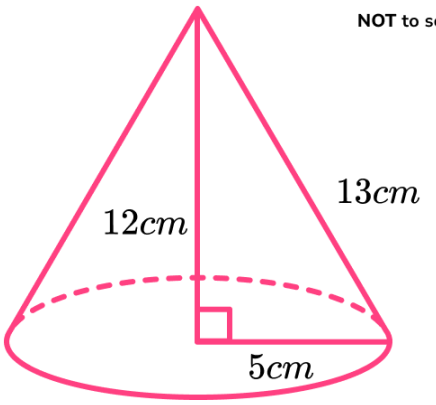
5)

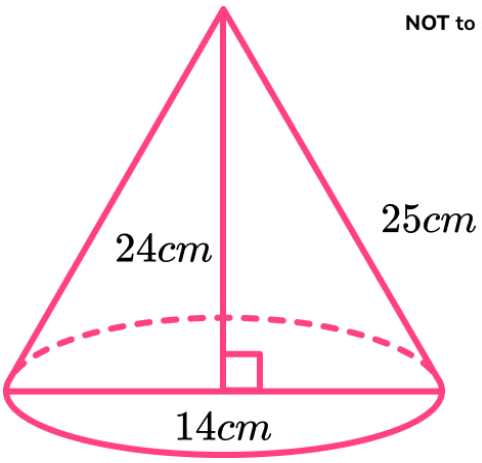
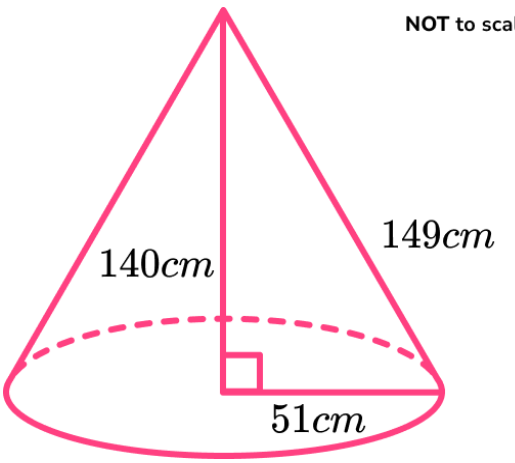


5) $118\ cm^2$

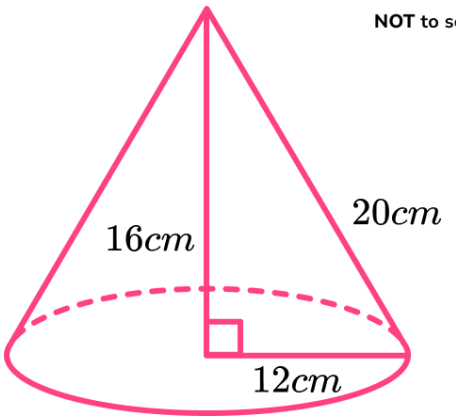
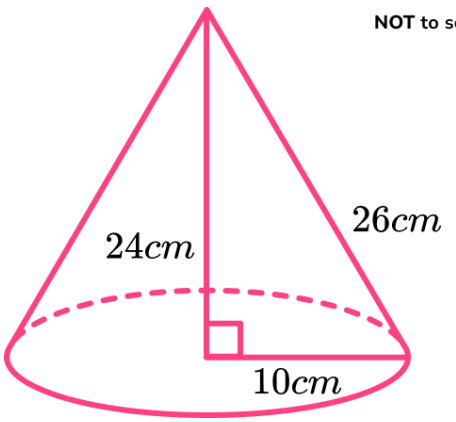
	6)  	**6)** $131\ cm^2$
	7)  	**7)** $352\ cm^2$
	8)  	**8)** $417\ cm^2$
	9)  	**9)** $398\ cm^2$

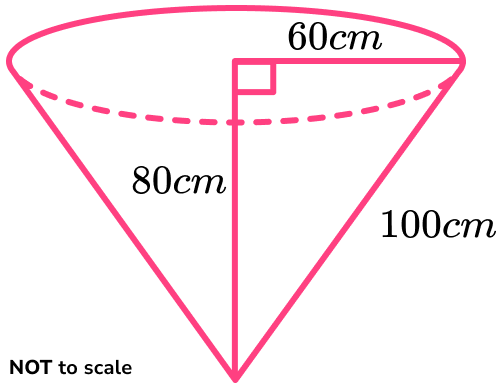
Volume and Surface Area of Cones - Answers

	Question	Answer
	Applied Questions	
1)	**a)** Here is a cone. NOT to scale  	**a)** $1020cm^3$
	b) Work out its volume. Give your answer to 3 significant figures. Work out its total surface area. Give your answer to 3 significant figures.	**b)** $679\ cm^2$
2)	**a)** Here is a cone. NOT to scale  	**a)** $100\pi\ cm^3$
	b) Work out its volume. Leave your answer in terms of π. Work out its total surface area. Leave your answer in terms of π.	**b)** $90\pi\ cm^2$

3)	**a)** Here is a cone.  **b)** Work out its volume. Give your answer to 3 significant figures. Work out its total surface area. Give your answer to 3 significant figures.	**a)** $1230\ cm^3$ **b)** $704\ cm^2$
4)	**a)** Here is a cone.  **b)** Work out its volume. Give your answer in terms of m^3 to 3 significant figures. Work out its total surface area. Give your answer in terms of m^2 to 3 significant figures.	**a)** $0.381\ m^3$ **b)** $3.20\ m^2$

Volume and Surface Area of Cones - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	Here is a cone.  Calculate the volume of the cone. Give your answer to 3 significant figures.	$= \frac{1}{3} \times \pi \times 12^2 \times 16$ **(1)** $= 2412.7... = 2410\ cm^3$ **(1)**	**(2)**
2)	Here is a cone.  Calculate the TOTAL surface area of the cone. Give your answer to 3 significant figures.	$= \pi \times 10 \times 26 = 260\pi = 816.814...$ **(1)** $= 816.814... + \pi \times 10^2$ **(1)** $= 360\pi = 1130.9... = 1130\ cm^2$ **(1)**	**(3)**

3)	A container is a cone of radius $60cm$, perpendicular height $80cm$ and slant height $100cm$.  **NOT** to scale Water fills the container at a rate of 12 $litres$ per minute. How long does it take to fill the container? Give your answer to the nearest minute. ($1\ litre\ =\ 1000\ cm^2$)	Volume: $\frac{1}{3} \times \pi \times 60^2 \times 80 = 310\,592.9...\ cm^3$ **(1)** Rate: 12 $litres$ per minute = 12 000 cm^3 per minute **(1)** Time: $310\,592.9... \div 12000 = 25.13...$ **(1)** Answer: 25 minutes **(1)**	**(4)**