Name:

Exam Style Questions

Surface Area of a Cone

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
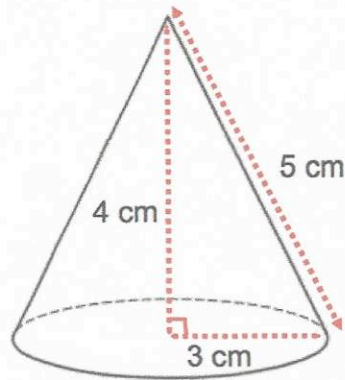5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 314

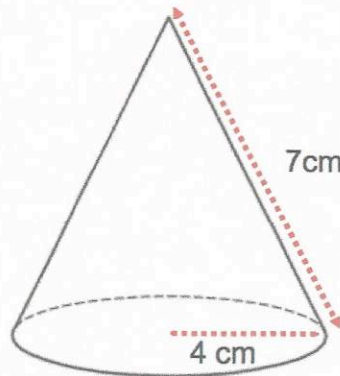1. A cone has base radius 3cm, perpendicular height 4cm and slant height 5cm.

Work out the surface area of the cone.

$\pi \times 3 \times 5 = 15\pi$

$\pi \times 3^2 = 9\pi$

24π

75.4 ....cm²

(3)

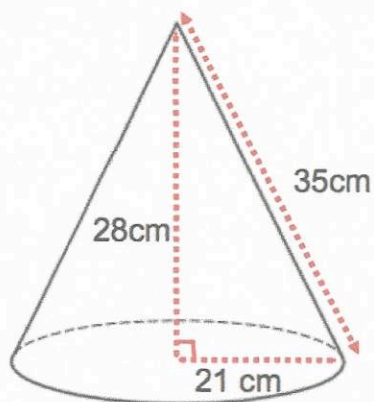2. A cone has base radius 4cm and slant height 7cm.

Work out the surface area of the cone.

$\pi \times 4 \times 7 = 28\pi$

$\pi \times 4^2 = 16\pi$

44π

138.2 ....cm²

(3)

3. A cone has base radius 3cm, perpendicular height 4cm and slant height 5cm.

Work out the surface area of the cone.

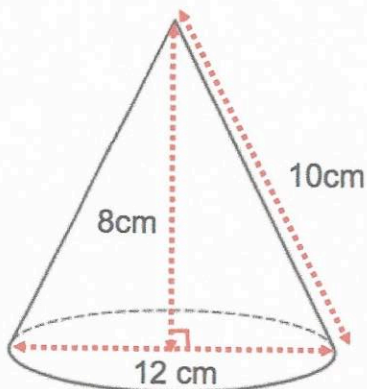$$\pi \times 21 \times 35 = 735\pi$$
$$\pi \times 21^2 = 441\pi$$
$$1176\pi$$

........3694·5........cm²

(3)

4. A cone has base diameter 12cm, perpendicular height 8cm and slant height 10cm.

Work out the surface area of the cone.

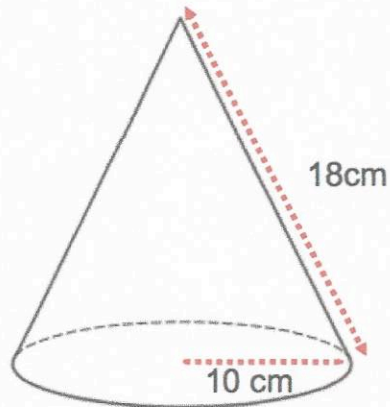$$\pi \times 6 \times 10 = 60\pi$$
$$\pi \times 6^2 = 36\pi$$
$$96\pi$$

........301·6........cm²

(3)

5. A cone has base radius 10cm and slant height 18cm.

18cm

10 cm

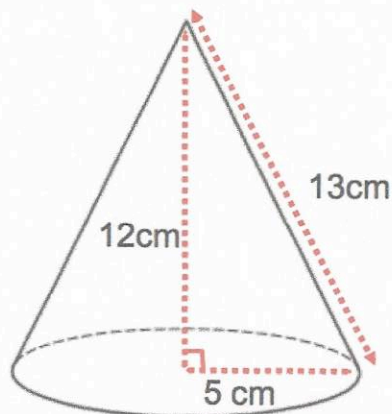Work out the surface area of the cone.
Give your answer in terms of π

$\pi \times 10 \times 18 = 180\pi$

$\pi \times 10^2 = \dfrac{100\pi}{280\pi}$

..................280π..............cm²

(3)

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6. A cone has base radius 5cm, perpendicular height 12cm and slant height 13cm.

13cm

12cm

5 cm

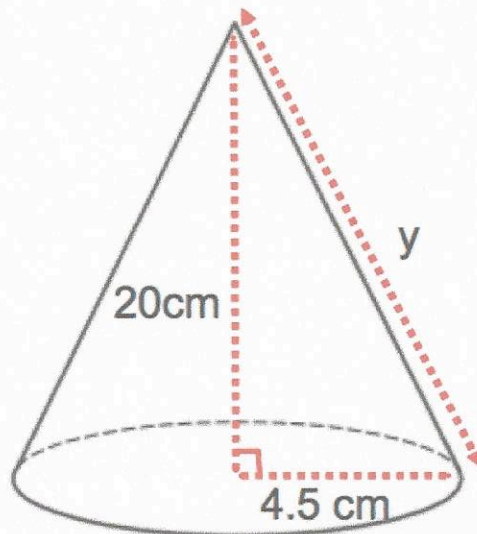Work out the surface area of the cone.
Give your answer in terms of π

$\pi \times 5 \times 13 = 65\pi$

$\pi \times 5^2 = \dfrac{25\pi}{90\pi}$

..................90π..............cm²

(3)

7. The diagram shows a cone.
   The vertical height is 20cm.
   The radius of the base is 4.5cm.
   The slant height is y

   (a) Work out the value of y.

   $20^2 + 4 \cdot 5^2 = 420 \cdot 25$

   $\sqrt{420 \cdot 25} = 20 \cdot 5$

   ....20·5........cm

   (3)

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

   $\pi \times 4 \cdot 5 \times 20 \cdot 5 = 289 \cdot 8119$

   $\pi \times 4 \cdot 5^2 = 63 \cdot 6172$

   ....353·4........cm²

   (3)

8. A cone has base diameter 10cm.
The height of the cone is 18cm.

Calculate the surface area of the cone.

$\pi \times 5 \times 18.682 = 293.5$

$5^2 + 18^2 = 349$

$\pi \times 5^2 = 78.5$

$\sqrt{349} = 18.68154$

372

372

........................cm²

(4)

9. A cone has base of radius 2cm.
The perpendicular height of the cone is 5cm.

5cm

x

2 cm
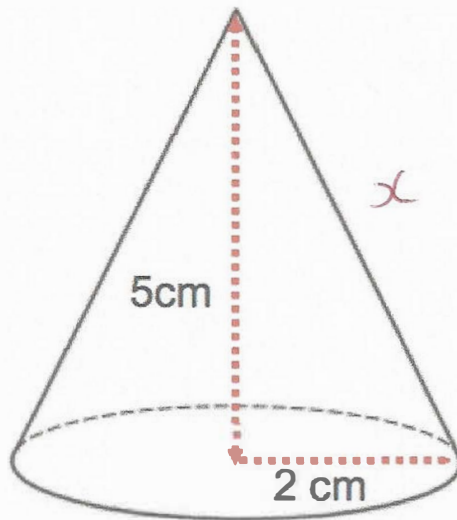
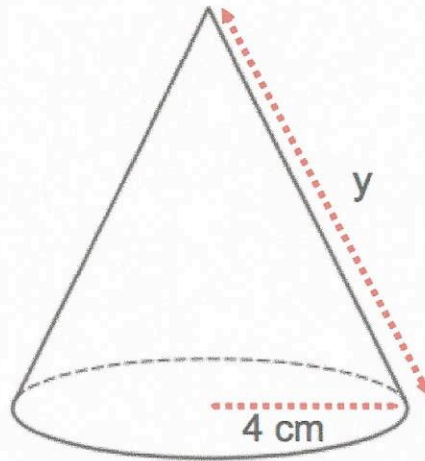Calculate the surface area of the cone.

$2^2 + 5^2 = 29$

$x = \sqrt{29}$

$\pi \times 2 \times \sqrt{29}$

$+ \ \pi \times 2^2 =$

46.4

........................cm²

(4)

10. Shown below is a cone.
The base has a radius of 4 cm.
The slant height is y cm.

4 cm

The total surface area of the cone is 48π cm²

Calculate y.

$$\pi \times 4^2 = 16\pi$$

$$\pi \times 4 \times y = 4y\pi$$

$$16\pi + 4y\pi = 48\pi$$

$$16 + 4y = 48$$
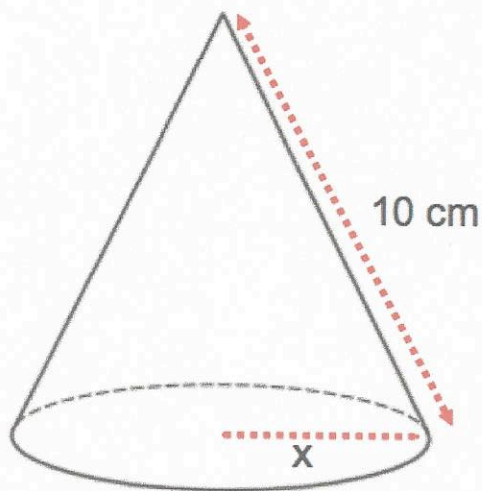
$$4y = 32$$

$$y = 8$$

...........8.........cm

(3)

11. Shown below is a cone.
The base has a radius of x cm.
The slant height is 10 cm.

10 cm

X

The total surface area of the cone is 39π cm²

(a) Show $x^2 + 10x - 39 = 0$

$$\pi \times x \times 10 = 10x\pi$$

$$\pi \times x^2 = x^2\pi$$

$$10x\pi + x^2\pi = 39\pi$$

$$x^2 + 10x = 39$$

$$x^2 + 10x - 39 = 0$$

(3)

(b) Hence, find the length of the radius.

$$(x+13)(x-3) = 0$$

$$x = -13, 3$$

$$x = 3 \quad \text{as can't be negative}$$

...........3.........cm

(2)