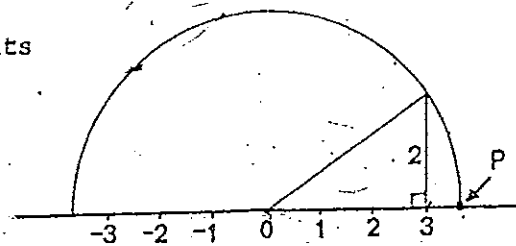


Part A - CIRCLE THE CORRECT ANSWER.

1. On the number line shown, the point P represents

- A. 3.5
- B. 5
- C.  $\sqrt{5}$
- D.  $\sqrt{13}$



2. Which of the following is a rational number?

- A  $\sqrt{3}$       B  $\sqrt[3]{2}$       C  $\sqrt[3]{4}$       D  $\sqrt{4}$

3.  $\sqrt{28} + \sqrt{7}$  simplifies to:

- A  $\sqrt{21}$       B 4      C 2      D 21

4.  $2\sqrt{2} \times 3\sqrt{5} = ?$

- A.  $6\sqrt{10}$       B.  $6\sqrt{7}$       C. 60      D.  $\sqrt{60}$

5.  $\sqrt{32}$  written in simplest form is:

- A  $4\sqrt{2}$       B  $2\sqrt{8}$       C  $2\sqrt{4}$       D  $2\sqrt{16}$

6.  $\sqrt[3]{31}$  is between:

- A 3 and 4      B 4 and 5      C 5 and 6      D 6 and 7

7.  $2\sqrt{3}(5\sqrt{5} - 4\sqrt{2})$  is the same as:

- A  $10\sqrt{15} - 8\sqrt{6}$       B  $7\sqrt{15} - 6\sqrt{6}$       C  $10\sqrt{8} - 8\sqrt{5}$       D  $10\sqrt{15} - 4\sqrt{2}$

8.  $5\sqrt{3} + 7\sqrt{3} + 3\sqrt{2}$  simplifies to:

- A  $15\sqrt{3}$       B  $12\sqrt{6} + 3\sqrt{2}$       C  $15\sqrt{8}$       D  $12\sqrt{3} + 3\sqrt{2}$

9. Write 0.37 as a simple fraction

12) Simplify

$$\sqrt{3} \times 2 \times \sqrt{6}$$

10. Simplify

$$\sqrt{49 p^{16}}$$

13) If  $8.66 < \sqrt{A} < 8.71$   
Find A if it is a whole number

11. Simplify

$$4\sqrt{15} \div \sqrt{3}$$

14) Simplify

$$\sqrt{80} \div 4$$

Part B

Write two surds which is equivalent to  $2\sqrt{45}$

12) Simplify

$$\sqrt{18} + \sqrt{50}$$

iii) Remove the brackets

$$(3\sqrt{2} + 1)(4 - 2\sqrt{2})$$

iv) \* Write with a rational denominator in simplest form

$$\frac{2\sqrt{6}}{\sqrt{10}}$$

v) Which of the following multiplications gives a rational number?

A.  $(3 - \sqrt{2})(3 + \sqrt{2})$

C.  $(\sqrt{3} + 2)(3 + \sqrt{2})$

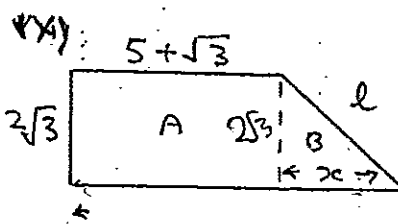
B.  $(3 + \sqrt{2})^2$

D.  $\sqrt{2}(3 + \sqrt{2})$

b) What is the rational number (answer)

vii) Simplify

$$\frac{\sqrt{10}}{\sqrt{60}} \times \frac{6\sqrt{15}}{2\sqrt{5}}$$



Find  
i)  $x =$

ii) Area of rectangle A

iii) Area triangle B

viii)

$$D = 5\sqrt{2\sqrt{10}} \quad \text{(simplified)}$$

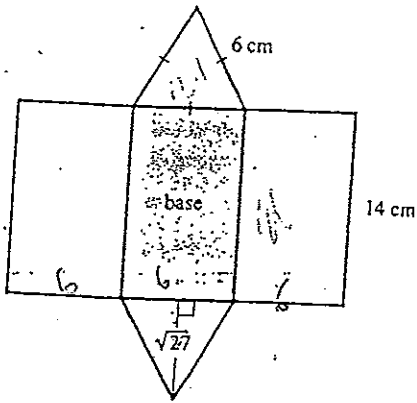
i) Find exact value of D when

iii) If  $D = 30$  Find  $V$

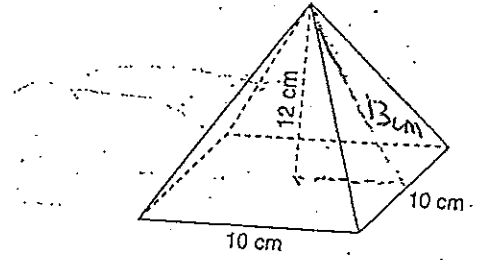
iv) Use Pythagoras Theorem to find  $l$  (exact value)

(1) Find the surface area to 1 decimal place where necessary

(a)

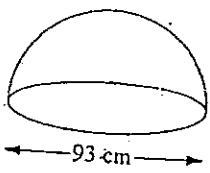


(2) To find the surface area of this square pyramid another measurement is needed



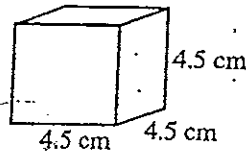
- i) mark it on the diagram and find this length
- ii) Find the total surface area

(b)



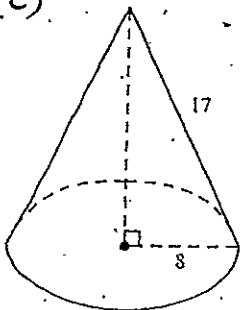
base included.

(3)



Find the surface area of this open cube (in  $\text{cm}^2$ )

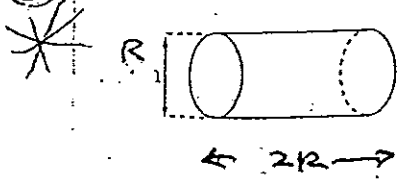
(c)



base included

(4) The surface area of a sphere is  $100 \text{ cm}^2$ . Find the radius (nearest mm)

(5)



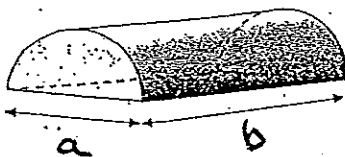
Find the total surface area in terms of  $R$ .

(6) The surface area of two spheres is in the ratio of  $4:9$

i) what is the ratio of the radii

ii) The surface area of the larger sphere is  $1200 \text{ cm}^2$ . What is the surface area of the smaller sphere

(7) The surface area of a complete cylinder is  $x \text{ cm}^2$ . What is the surface area of the figure below.

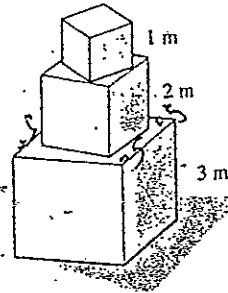


S.A

(8)

A paint roller, in the shape of a cylinder, has radius 3 cm and length 25 cm. What area of wall is painted with one complete revolution of the roller?

(9)

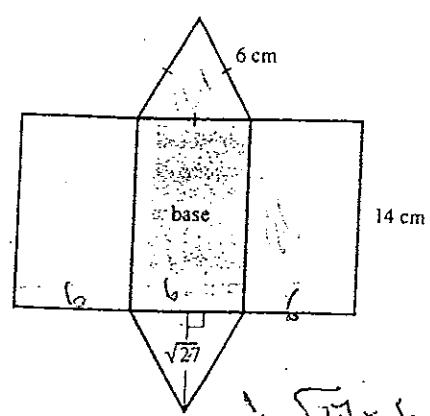


Three large wooden cubes (with the given edges) are arranged in a pile on the floor.

Work out the total visible surface area.

Find the surface area correct to 1 decimal place where necessary

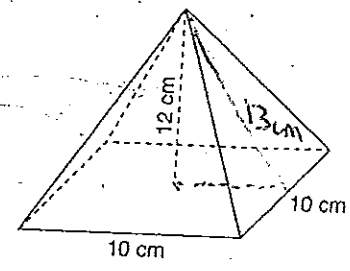
$\frac{22}{7}$



$$\frac{1}{2} \times \sqrt{27} \times 6 \times 2 + 14 \times 6 \times 2 + 14 \times 6$$

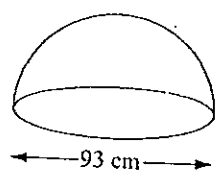
$$= 283.2 \text{ cm}^2$$

② To find the surface area of this square pyramid another measurement is needed



i) mark it on the diagram and find this length  
length = 13 cm ✓

ii) Find the total surface area  
 $10^2 + 4 \times \frac{1}{2} \times 13 \times 10$   
 $= 360 \text{ cm}^2$  ✓



base included.

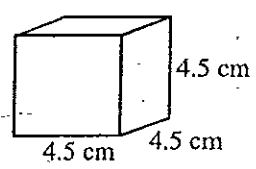
$$2\pi r^2 + \pi r^2 = 3\pi r^2$$

$$= 3 \times \pi \times 46.5^2$$

$$= 20378.7 \text{ cm}^2$$

✓

③



Find the surface area of this open cube

(in  $\text{cm}^2$ )

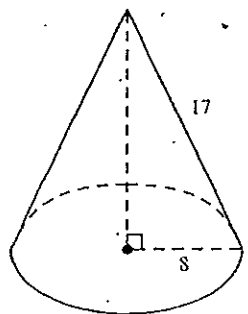
$$6 \times 2 = 4.5^2$$

$$6 \times 4.5 = 4.5^2$$

$$= 101.25 \text{ cm}^2$$

✓

c)



base included  
 $\pi r^2 + \pi r l$

$$= \pi \times 8^2 + \pi \times 8 \times 17$$

$$= 200\pi$$

✓

④ The surface area of a sphere is  $100 \text{ cm}^2$ . Find the radius (nearest mm)

$$4\pi r^2 = 100 \text{ cm}^2$$

$$r^2 = \frac{100 \text{ cm}^2}{4\pi}$$

$$r = 88.6$$

$$r = 89$$

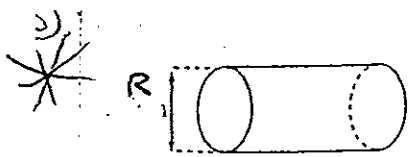
$$r = \sqrt{\frac{100}{4\pi}}$$

2.

~~$$r = 88.6 \text{ cm}$$~~

radius = 89 mm

13



Find the total surface area in terms of R.

$$2\pi R^2 + 2\pi R \times h$$

$$2\pi R^2 + 2\pi R h$$

$$= 2\pi R^2 + 2\pi R h$$

$$= 4\pi R^2 + \frac{R}{2} \times 2R = 2 \times \pi \times \left(\frac{R}{2}\right)^2 + 2 \times \pi \times R \times \frac{R}{2}$$

2.

6) The surface area of two spheres is in the ratio of 4:9

i) what is the ratio of the radii 2:3

ii) The surface area of the larger sphere is 1200 cm<sup>2</sup>

What is the surface area of the smaller sphere

4:1200

$$\frac{A^2}{4^2} = \frac{1200}{9^2}$$

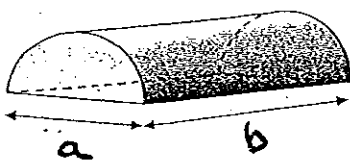
$$A = \frac{1200 \times 4^2}{9^2} = 237.04 \text{ (2dp)}$$

$$4\pi r^2 = 1200$$

$$r = \sqrt{\frac{1200}{4\pi}}$$

$$r = 30.70$$

7) The surface area of a complete cylinder is x cm<sup>2</sup>. What is the surface area of the figure below.



$$\frac{x}{2} + ab$$

$$S.A = \pi R^2 + \frac{1}{2} \times 2\pi R h$$

$$= \pi \times \left(\frac{a}{2}\right)^2 + \frac{1}{2} \times 2 \times \pi \times \frac{a}{2} \times b$$

8

A paint roller, in the shape of a cylinder, has radius 3 cm and length 25 cm. What area of wall is painted with one complete revolution of the roller?

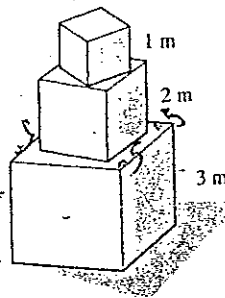
$$2\pi R h = \text{paint of wall}$$

$$2 \times \pi \times 3 \times 25$$

$$= 471.24 \text{ (2dp)}$$

2

9



Three large wooden cubes (with the given edges) are arranged in a pile on the floor.

Work out the total visible surface area.

$$4 \times 3^2 + 4 \times 2^2 + 5 + .5^2 + 1$$

$$= 58.25 \text{ m}^2$$

65

$$4 \times 3^2 + 4 \times 2^2 + 5 + 3^2 + 3^2 - 2^2$$

$$= 65$$

9