**F.3 Mathematics – Supplementary Worksheet for NCM 3B Chapter 10**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Class: 3\_\_\_\_\_\_ ( )**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

15 cm

18 cm

*V*

*P*

*Q*

*R*

*S*

**Level 1**

1. The figure shows a right pyramid. Its base is a square of side 18 cm. The slant edge is 15 cm. Find its total surface area.

(10 marks)

12 cm

8 cm

*V*

*A*

*B*

*C*

*D*

2. The figure shows a right pyramid with a square base.

Find

(a) the height of the pyramid,

(b) the volume of the pyramid.

(*Give the answers correct to 3 significant figures.*)

(14 marks)

3. A metal rectangular box with dimensions 12 cm × 6 cm × 5 cm is melted down and recast to form a circular cone of base radius 10 cm. Find the height of the cone.  
(*Give the answer correct to 3 significant figures.*)

(9 marks)

4. A right circular cone is formed by rolling the sector as shown and joining the edges *OP* and *OQ*. Find the volume of the cone.

*P*

*Q*

## O

12 cm

150°

(*Give the answer correct to 3 significant figures.*)

(12 marks)

5. In the figure, the solid consists of a right circular cone and a hemisphere with a common base. Find the volume of the solid.  
(*Give the answer correct to 3 significant*

15 cm

10 cm

*figures.*)

(10 marks)

6. A sphere with diameter 46 cm is cut into two hemispheres.

(a) Find the percentage increase in the total surface area.

(b) Now, one of the hemispheres is melted and recast into three cubes. Find the length of the side of each cube.

(*Give the answers correct to 3 significant figures if necessary.*)

(14 marks)

7. Refer to the solid as shown. Identify which measurement (liner, quadratic or cubic) is represented by each of the expressions below.

*a*

*h*

*a*

*R*

(a) 

(b) 

(c) 

(9 marks)

8. In a plan of an office, 1 cm on the plan represents an actual length of 5 m. If the area of the plan is 50 cm2, find the actual area of the office.

(10 marks)

9. Given that bottles *P* and *Q* are two similar containers. The surface area and the volume of bottle *P* are 300 cm2 and 700 cm3 respectively. If the height of bottle *Q* is 40% higher than that of bottle *P*, find

(a) the surface area of bottle *Q*,

(b) the volume of bottle *Q*.

(12 marks)

**Level 2**

10 cm

*V*

*A*

*B*

*C*

*D*

*P*

1. The figure shows a right pyramid with a square base. Diagonals *AC* and *BD* intersect at *P*. *AC* = 16 cm, *VC* = 10 cm. Find

(a) *AB*,

(b) *VP*,

(c) the volume of the pyramid.

(*Give the answers correct to 3 significant figures if necessary.*)

(12 marks)

1. The figure shows a right pyramid with a rectangular base. The heights *VM* and *VN*

*V*

*P*

*Q*

*R*

*S*

*M*

*N*

*O*

7 cm

cm

cm

of triangles *VPQ* and *VSP* are 7 cm and cm respectively. The height *VO* of the pyramid is cm. Find the total surface

area of the pyramid.

(*Give the answer correct to 3 significant figures.*)

(12 marks)

6 cm

24 cm

*D*

*O*

*A*

*B*

*C*

*M*

8 cm

*N*

3. In the figure, a right conical vessel standing vertically contains some water.

(a) Find the total area of the material used to make the vessel.

(b) Find the area of the surface in contact with the water.

(*Give the answers correct to 3 significant figures.*)

(18 marks)

4. It takes 2 500 cm3 of water to fill up a conical paper cup. The same amount of water can fill up a right pyramid with a square base of side 25 cm. It is given that the height of the cup is two-third of that of the pyramid. Find the surface area of the paper cup. (*Give the answer correct to 3 significant figures.*) (14 marks)

5. It is given that the radii of a hemisphere and a right circular cone are the same. The volume of the cone is  of that of the hemisphere. By what percentage is the height of the cone greater than the radius of the hemisphere?

(12 marks)

6. A cylindrical glass of base radius 8 cm and height 15 cm contains some water, and the depth of water in the glass is 9 cm. Now, a metal ball of surface area 144π cm2 is totally submerged into the water.

(a) What is the rise of water level in the glass?

(b) Then, five identical silver balls are totally submerged into the water and the water level just reached the top of the glass without overflow. Find the radius of each silver ball.

(*Give the answer correct to 3 significant figures.*) (15 marks)

7. Refer to the solid as shown. Identify which measurement (liner, quadratic or cubic) is

*a*

*b*

*c*

*h*

represented by each of the expressions below.

(a) 

(b) 

(6 marks)

8. In the figure, a right rectangular pyramid *Z* is cut by a plane parallel to the base into three parts *P*, *Q* and *R* with the same height. Find

volume of *P* : volume of *Q* : volume of *R*.

*P*

*Q*

*R*

(11 marks)