## ST ALOYSIUS’ COLLEGE



## Year 10 Mathematics Stage 5.3 Term One Assessment

## Thursday 4th April 2019

### Time allowed: 45 minutes

Name:

Teacher: Mort O’Neill Luchi

Instructions:

* Approved calculators may be used.
* Show working where necessary
* Circle the correct letter for multiple choice questions

**TOTAL MARKS: 50**

**SECTION I: Measurement** 20 Marks

1. The formula for the surface area (*S*) of a **closed** cylinder with radius *r* and height *h* is given by:

A. 

B. 

C. 

D. 

1. A cone with a base diameter of 10 m and vertical height of 12 m will have a slant height (in metres) of:
2. 13
3. 14
4. 15
5. 
6. Convert the following:

(i)50713 m = \_\_\_\_\_\_\_\_\_\_\_ km **1**

(ii) 0.345 m2 = \_\_\_\_\_\_\_\_\_\_\_\_ cm2 **1**

1. Find the volume of the closed hemisphere, to the nearest cubic metre. **3**

22 m

1. Calculate the volume, to the nearest m3, of a cone with height 11.2 m and diameter 8 m. **2**
2. A square pyramid has a total surface area of 27 cm2 and a base length of 3 cm. The slant height of the pyramid is ***x*** cm.

(i) Form an equation, in terms of ***x***, for the total surface area of the pyramid. **1**

(ii) Given that the total surface area of the pyramid is 27 cm2, solve the **1**

equation to find the value of ***x****.*

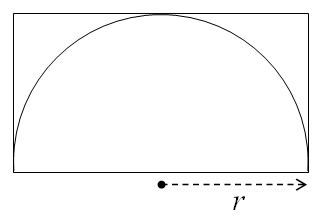




A `hopper' is a hollow storage container. This hopper is made by joining a cube and square pyramid, each of height *x* m. It is used to fill a cylindrical tank of diameter 2.2 metres and length 7 metres.

1. Find the volume of the cylindrical tank in exact form. **2**
2. Find a formula for the volume (*V*) of the hopper in terms of *x*. **2**
3. A full load in the hopper exactly fills the tank. Find the value of *x* correct to one **2** decimal place.

1. A semi-circle of radius *r* is drawn in a rectangle as show below.



1. What percentage of the area of the rectangle is the semi-circle? Answer to the **2**

nearest percentage.

1. How will the area of the semi-circle change if the radius is doubled? **1**

**END OF SECTION I**



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**SECTION II: Surds and Indices** 30 Marks

1. Simplify 
2. 
3. 
4. 
5. 
6. Which of the following is **NOT** equal to?
7. 
8. 
9. 
10. 
11. Simplify the following:
    1.   **1**
    2. ** 1**
    3.   **1**
12. Expand leaving your answer in simplest form
13.  **1**
14.  **2**

1. By rationalising the denominator, express  in the form . **3**
2. Find the value of  if  **3**
3. Find a pair of values for *x* and *y* such that (*x* + *y*)(*x* – *y*) = 1 **2**

1. Fully simplify the following:
   1.  = **1**
   2.  = **1**
   3.  **= 1**
   4. ** = 2**
2. Fully simplify  **3**
3. Simplify the following, expressing your answers with positive powers of *a*. **3**
4. Show  can be simplified to  **3**

**END OF ASSESSMENT**