St. Peter the Apostle High School

Mathematics Dept.



PracticePrelim SevenPaper 1

Duration: 54 Minutes

Marks: 36

- 1. Attempt ALL questions.
- 2. You <u>MAY NOT</u> use a calculator.
- 3. Write your solutions on the blank paper provided.
- 4. Full credit will be given only where the solution contains appropriate working.
- 5. Square-ruled paper will be provided if necessary.

Formula Sheet

The roots of
$$ax^2 + bx + c = 0$$
 are $x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Sine rule:

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$ or $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

Area of a triangle: Area = $\frac{1}{2}ab \sin C$

- Volume of a sphere: Volume = $\frac{4}{3}\pi r^3$
- Volume of a cone: Volume = $\frac{1}{3}\pi r^2 h$
- Volume of a pyramid: Volume = $\frac{1}{3}Ah$

Standard deviation:
$$s = \sqrt{\frac{\sum (x - \overline{x})^2}{n-1}} = \sqrt{\frac{\sum x^2 - (\sum x)^2 / n}{n-1}}$$
, where n is the sample size.

<u>Marks</u>

2

- **1.** Evaluate $16.9 + 0.54 \times 40$
- 2. Change the subject of the formula to r: $P = \frac{kQ}{r^2}$ 3
- **3.** Factorise fully: $4x^2 10x 6$.
- Sparks Electrical are having their annual clearance sale where everything is reduced by 40%.

A Flat screen TV cost £480 in the sale.

How much did the TV originally cost?

Alli items reduced by 40%

- 5. Express as a single fraction in its simplest form
- 6. Does the point (10,10) lie on the line shown below?[You must show working]



 $\frac{3}{x} - \frac{2}{x-5}.$

7. a) Simplify
$$\frac{7a^3b^2}{a\sqrt{b}}$$
 3

b) If a = -1 and b = 4, find the value of the expression in part (a).



3

3

3

4

2

1

4

8. a) Write down the value of tan A from the triangle above.



- **b**) Trig Identities Not covered yet!!
- 9. When two numbers (x and y) are added together the answer is 2.
 When the same two numbers are multiplied together the answer is -48.
 By creating a system of equations and solving them, find the two numbers.
- **10.** A sequence of numbers is: **7, 19, 37**

Numbers from this sequence can be written in the following way :

1 st term :	7	=	$2^3 - 1^3$
2 nd term :	19	=	$3^3 - 2^3$
3 rd term :	37	=	$4^3 - 3^3$

a)	Write down a similar expression for the 4 th term.	1
b)	Hence or otherwise find the n^{th} term in its simplest form.	3

11. The diagram shows part of the graph of the function $y = x^2 + x - 6$.

The graph cuts the x – axis at the points P and Q.

Find the distance PQ.



4