St. Peter the Apostle High School

Mathematics Dept.

N5 Practice Prelim Two Paper 1

Duration: 1 Hour **Marks: 40**

1. Attempt ALL questions.
2. You **MAY NOT** 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 $x = \dfrac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Sine rule: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

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

Volume of a sphere: Volume = $\dfrac{4}{3}\pi r^3$

Volume of a cone: Volume = $\dfrac{1}{3}\pi r^2 h$

Volume of a pyramid: Volume = $\dfrac{1}{3}Ah$

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

Marks

1. Multiply out the brackets and simplify $(3-x)(5-3x)$ **2**

2. **a)** Express x^2-6x-4 in the form $(x+a)^2+b$. **2**

b) If the graph of $y=x^2-6x-4$ is drawn, what would the coordinates and nature of the turning point be? **2**

3. Evaluate $\frac{5}{8}$ of $\frac{4}{7}+\frac{4}{5}$ **3**

4. A company made a profit of £42 000 in 2014. This was 20% more than the profit they made in 2013.

How much profit did they make in 2013? **3**

5. By calculating the discriminant, state the nature of the roots of $y=x^2-5x-4$ **3**

6. Find the equation of the line which is parallel to $3y-4x=12$ and passes through the point (2, – 3).

Give your answer in the form $ax + by = c$ **3**

7. Express $\sqrt{6}\times\sqrt{8}-3\sqrt{3}$ as a surd in its simplest form. **3**

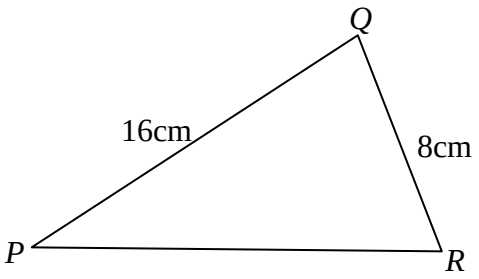
8. Simplify $\frac{3x^5\times 4y^3}{6x^{-2}y^4}$ expressing your answer with positive indices. **3**

Marks

9. In this triangle PQ = 16cm and QR = 8cm.

The value of sin P = 0·4.

Find the exact value of sin R.



3

10. Given that $P = \frac{3Q}{R^2}$, change the subject of the formula to R. **3**

11. Sandi takes the bus to work each day. Over a two week period, she records the number of minutes the bus is late each morning.

The results are shown below:

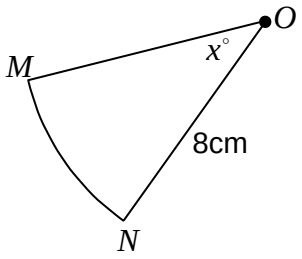
0 2 5 6 6 7 8 9 11 15

Find the semi-interquartile range of this data set. **2**

12. A sector of a circle with radius 8cm is shown opposite.

Angle $MON = x^\circ$

If the exact **length** of the arc MN is 2π centimetres, calculate the size of the angle marked x.

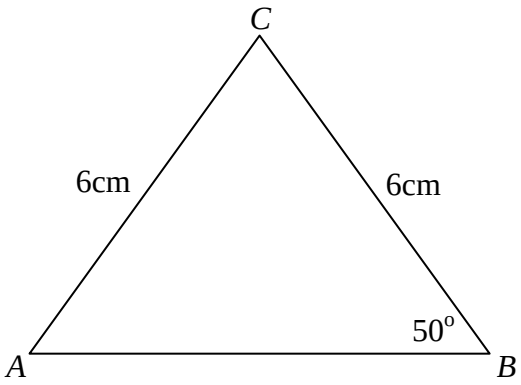


4

13. Isosceles triangle ABC is shown below.

Show that the length of AB can be given by the expression

$AB = \sqrt{72(1-\cos 80^0)}$ cm.



4

Total Marks: 40

End of question Paper