

N5

Trinity High School
Practice Exams
2019

Mathematics
Paper 1 (non-calculator)

Thursday, 10th January

0900 - 1000

Fill in your details and then read the instructions below.

Forename(s)

Surname

Seat Number

Total marks — 40

Attempt **ALL** questions.

You may **NOT** use a calculator.

To earn full marks you must show your working in your answers.

State the units for your answer where appropriate.

Write your answers clearly in the spaces provided in this booklet.

Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use blue or black ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

Formulae List

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: $A = \frac{1}{2} ab \sin C$

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

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

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

Standard deviation: $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$

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

1. Evaluate $2\frac{2}{5} \div \frac{8}{9}$

3

2. Multiply out the brackets and collect like terms:

$$4(2x^2 - 3) - (2x + 1)(x + 3)$$

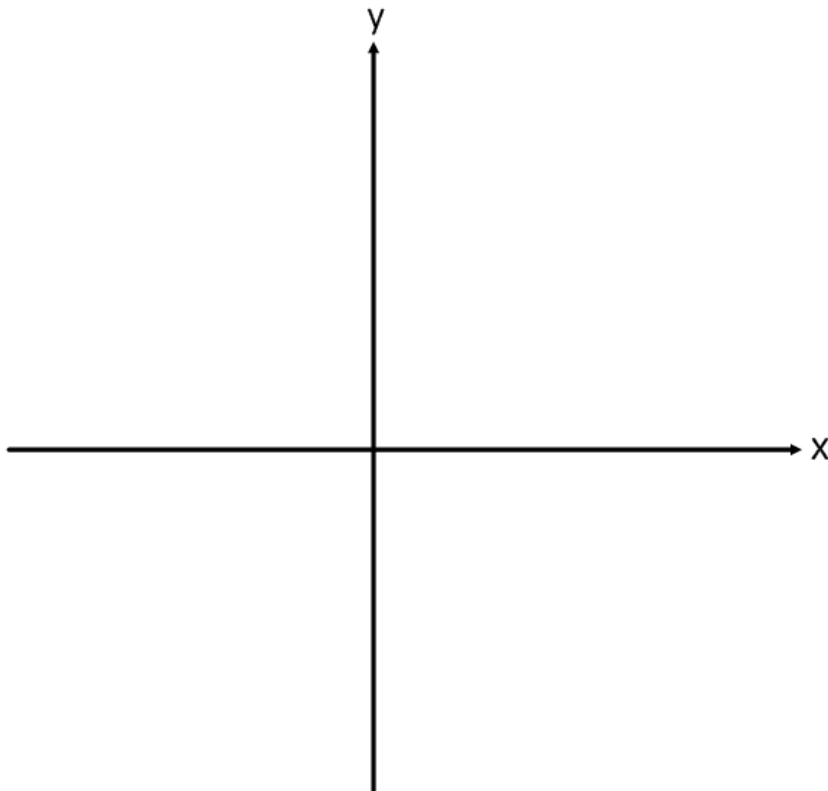
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3. Change the subject of the formula $p = \frac{v^2 + q}{2}$ to v .

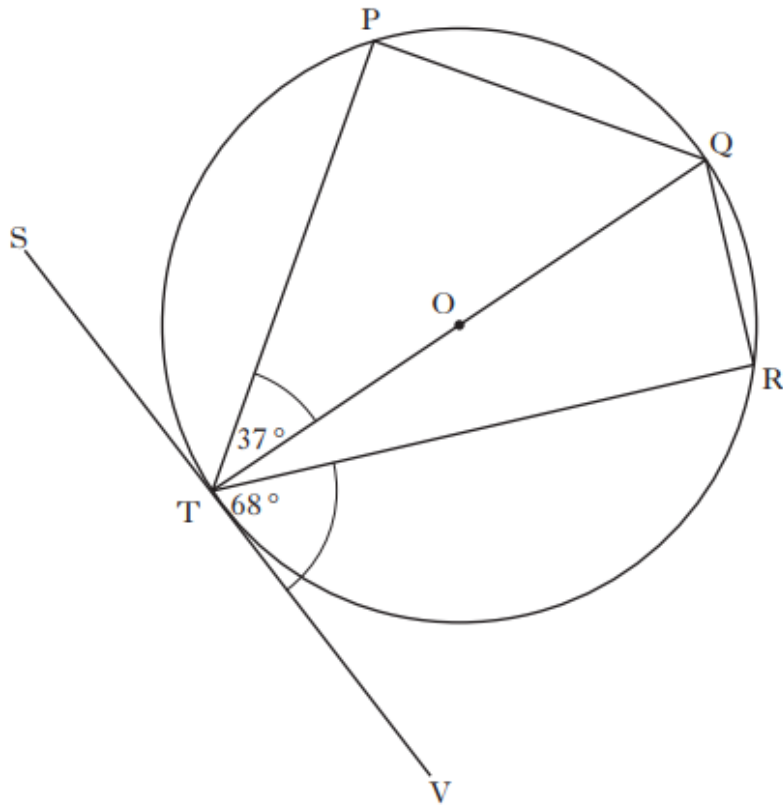
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4. A straight line has equation $y = px + q$, where $p < 0$ and $q > 0$.
On the axes below sketch a line that could match this equation.

2



5.



The tangent SV touches the circle, centre O , at T .

Angle PTQ is 37° , and angle VTR is 68° .

Calculate the size of angle PQR .

3

6. Fully factorise:

$$27 - 12k^2$$

2

7. Express $x^2 - 8x + 3$ in the form $(x + p)^2 + q$.

2

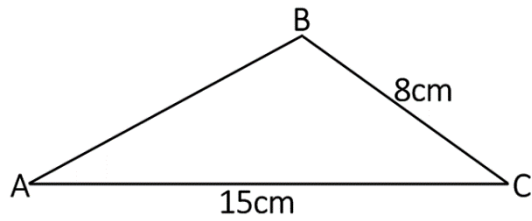
8. Simplify $\frac{(3p^4)^2 \times 4p^3}{12p^5}$

3

9. Express $\frac{1}{\sqrt[5]{m}}$ in the form m^n .

2

10. Triangle ABC is shown in the diagram below.
AC has length 15cm and BC has length 8cm.



Given that the value of $\sin C = \frac{3}{5}$, calculate the area of triangle ABC.

2

11. A promotional box of cereal contains 20% extra free.
The promotional box contains 540g of cereal.
How many grams of cereal does the standard box contain?



3

12. In Coster's Café, the cost of buying three coffees and two teas is £9·90.

(a) Illustrate this information in an equation.

1

(b) An order for four coffees and five teas is £17·40.

Illustrate this information in an equation.

1

(c) Find, algebraically, the cost of one coffee and the cost of one tea.

3

13. A function is defined as $f(x) = 4 - 3x$.

(a) Evaluate $f(3)$

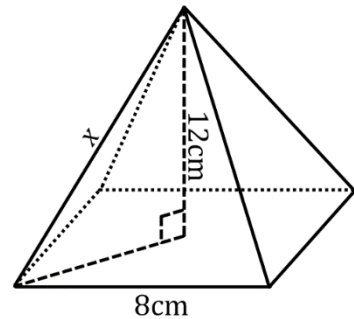
1

(b) Given that $f(p) = 25$, find the value of p .

2

14. The square-based pyramid in the diagram below has a base length of 8cm and a height of 12cm.

Calculate the length of the sloping side, x , leaving your answer as a surd in its simplest form.



4

[End of Questions]

[Additional space for answers]

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