N5

NATIONAL

QUALIFICATIONS

Mark

N5/G1

Mathematics

Paper 1

1 HOUR

(Non-calculator)

Prelim Practice G

Fill in these boxes and read what is printed below

Forename(s)

Surname

Teacher

Total Marks - 40

Attempt ALL questions.

You must 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 book 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 $x = \dfrac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

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

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

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

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

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

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

MARKS

Total marks — 40
Attempt ALL questions

1. Evaluate $\frac{2}{5} \div 1\frac{1}{10}$. **2**

2. Factorise fully $2m^2 - 18$. **2**

3. Given that $f(x) = 5 - x^2$, evaluate $f(-3)$. **2**

4. Solve the equation $3x + 1 = \frac{x-5}{2}$ **3**

5. Express $\sqrt{63} + \sqrt{28} - \sqrt{7}$ as a surd in its simplest form. **3**

6. Solve $x^2 - 3x - 10 = 0$ **3**

7. Alan is taking part in a quiz. He is awarded x points for each correct answer and y points for each wrong answer. During the quiz, Alan gets 24 questions correct and 6 wrong. He scores 60 points.

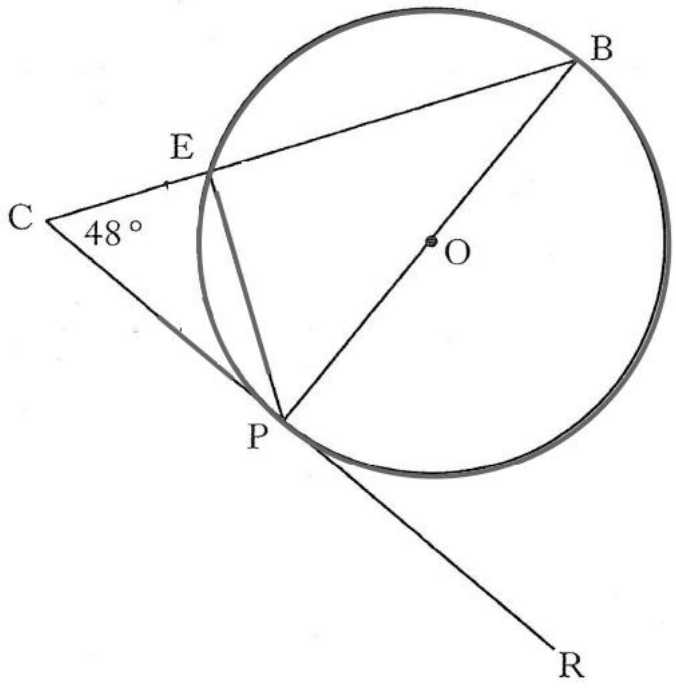
a) Write down an equation in x and y which satisfies the above condition. **1**

Helen also takes part in the quiz. She gets 20 questions correct and 10 wrong.
She scores 40 points.

b) Write down a second equation in x and y which satisfies this condition. **1**

c) Calculate the score for David, who gets 17 correct and 13 wrong. **4**

8. A circle, centre O, is shown below.

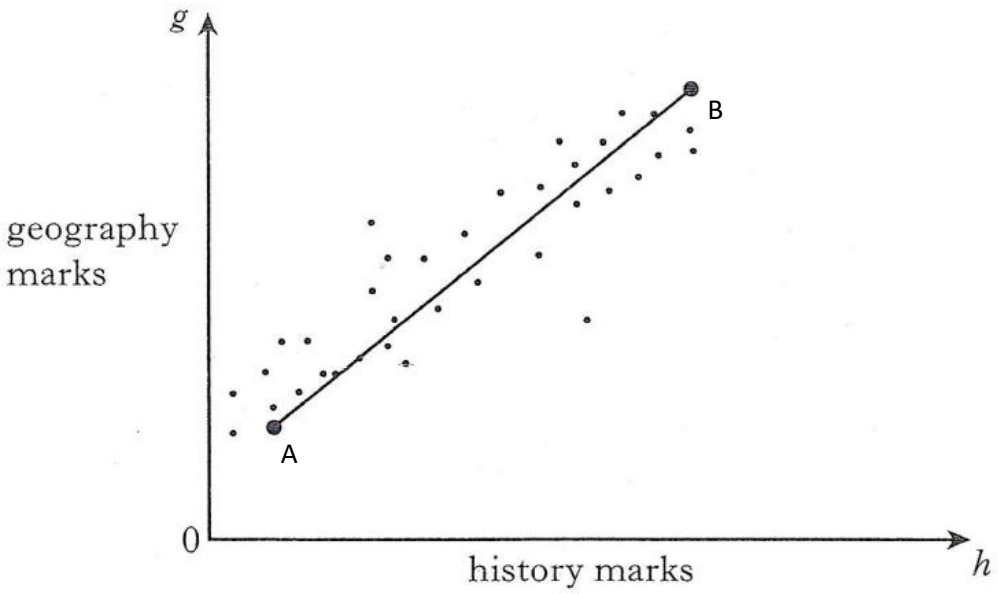


In this circle:

- PB is a diameter
- CR is a tangent to the circle at point P
- Angle BCP is 48°.

Calculate the size of EPR. **3**

9. The graph below shows the relationship between the History and Geography marks of a class of students.



A best-fitting straight line AB has been drawn.

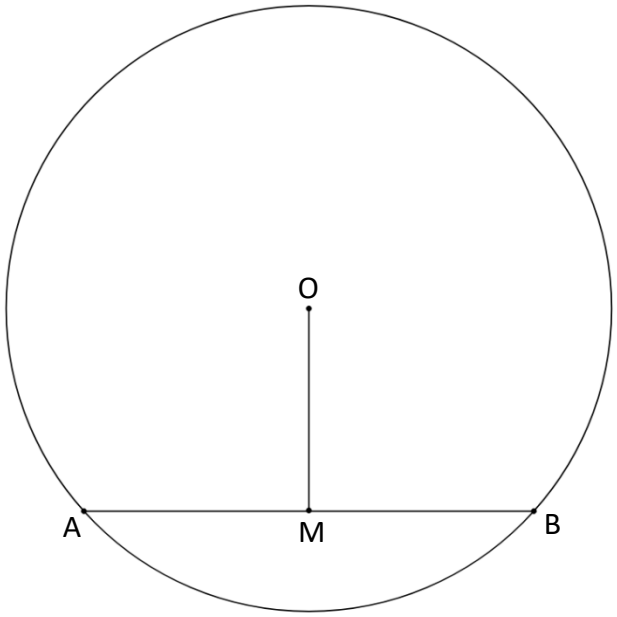
Point A represents a student who gained 12 marks for History and 20 marks for Geography.

Point B represents a student who gained 92 marks for History and 80 marks for Geography.

Find the equation of the straight line AB in terms of h and g. **3**

10. A circle with diameter 24cm is shown below with centre O.

- Line AB is a chord of the circle.
- Line OM is **perpendicular** to chord AB.
- The length of OM is 8 centimetres.



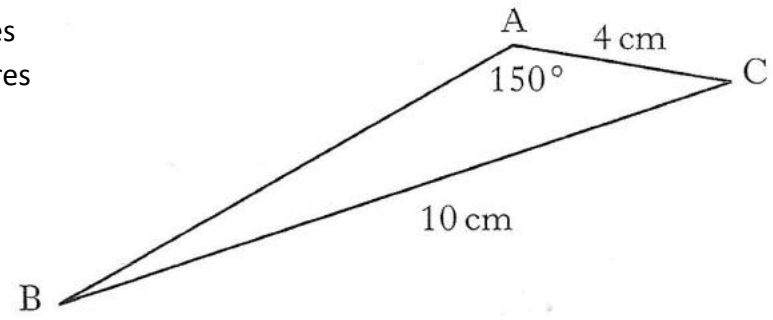
Calculate the length of chord AB, giving your answer in as a **simplified surd**. **4**

11. Express $\frac{b^{\frac{1}{2}} \times b^{\frac{5}{2}}}{b^2}$ in its simplest form. **2**

12. A straight line has equation $3x - 2y - 6 = 0$.
Determine the gradient of the line. **3**

13. In the triangle ABC

- AC = 4 centimetres
- BC = 10 centimetres
- Angle BAC = 150°



Given that $\sin 30° = \frac{1}{2}$, show that $\sin B = \frac{1}{5}$. **4**

[END OF QUESTION PAPER]