N5

NATIONAL

QUALIFICATIONS

Mark

N5/H1

Mathematics

Paper 1

1 HOUR

(Non-calculator)

Prelim Practice H

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 $4\frac{1}{3} - 1\frac{1}{2}$. **2**

2. Expand and simplify $(3x - 2)(2x^2 + x + 5)$. **3**

3. Change the subject of the formula to t:

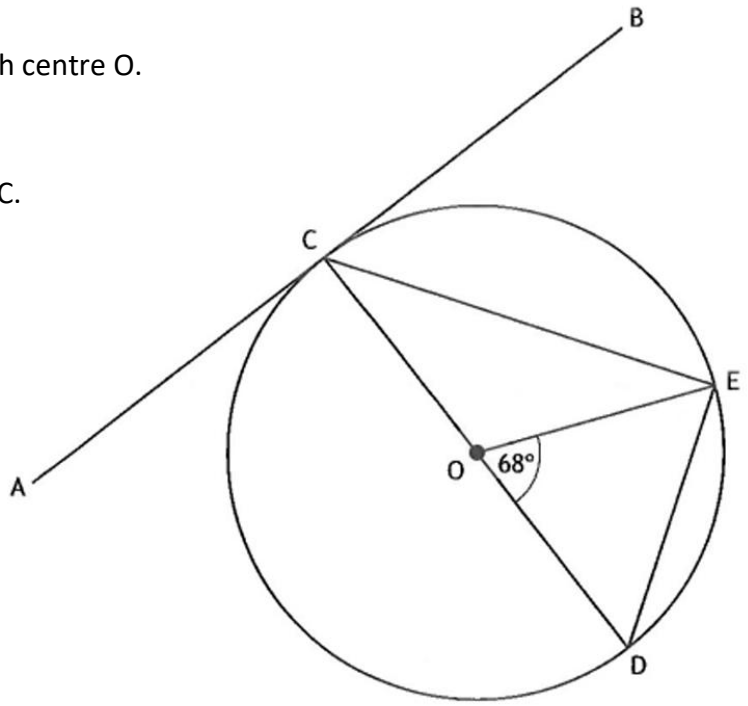
$$p = \frac{3t}{r}$$ **2**

4. The diagram shows a circle with centre O.

AB is a tangent to the circle at C.

CD is a diameter of the circle.

Angle EOD is 68°.

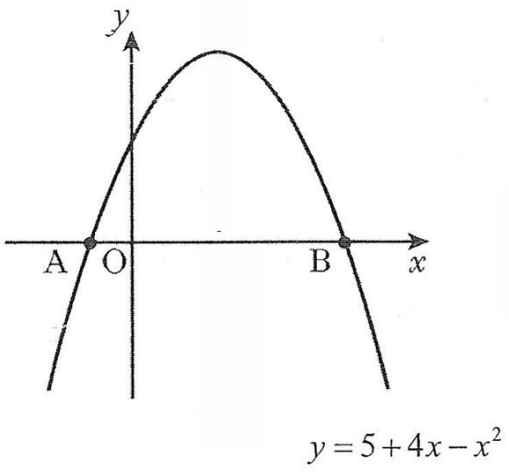


Calculate the size of angle ACE. **3**

5. Express $\frac{x^2+x-20}{3x^2-12x}$ in its simplest form. **3**

6. Evaluate $9^{\frac{3}{2}}$ **2**

7. The diagram shows part of the graph of $y = 5 + 4x - x^2$.



A is the point (-1,0).

B is the point (5,0).

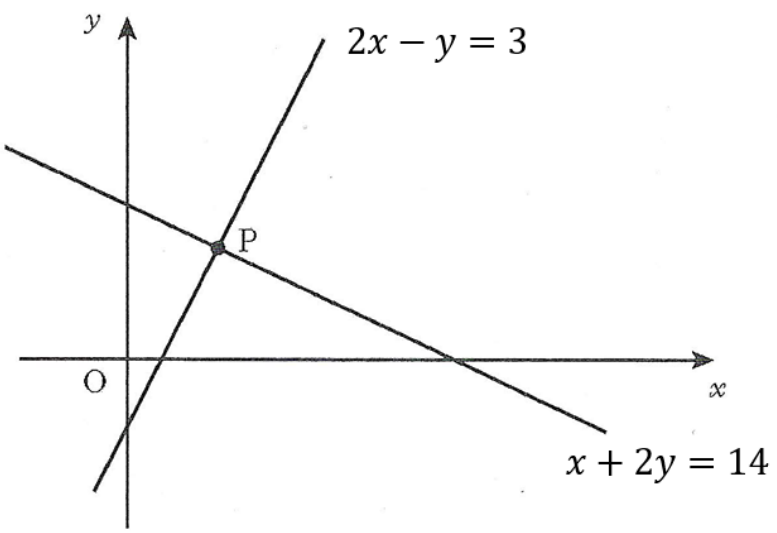
a) State the equation of the axis of symmetry of the graph. **2**

b) Hence, find the coordinates of the maximum turning point of $y = 5 + 4x - x^2$. **2**

c) Find the coordinates at which the graph intersects the y-axis. **1**

8. The graph below shows two straight lines.

- $2x - y = 3$
- $x + 2y = 14$



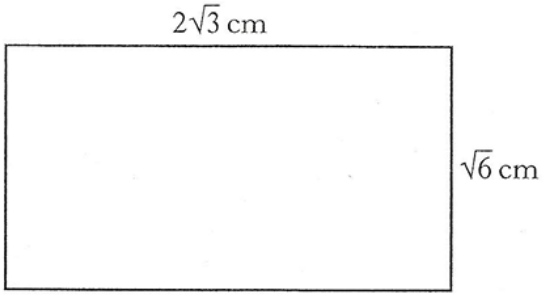
The lines intersect at the point P.

Find, **algebraically**, the coordinates of P. **3**

9. Express $\frac{9}{\sqrt{6}}$ with a rational denominator. **2**

10. Simplify $\frac{(m^3)^{-2}}{m^{-4}}$. Write your answer with a **positive power**. **3**

11. The rectangle below has length $2\sqrt{3}$ centimetres and breath $\sqrt{6}$ centimetres.

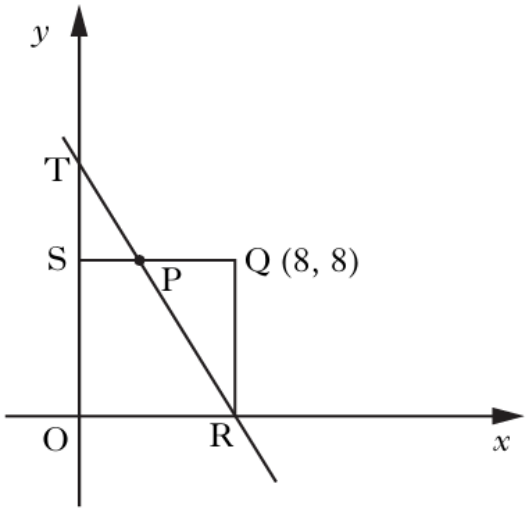


Calculate the area of the rectangle, giving your answer as a **simplified surd**. **3**

12. Solve the inequation $4(3 - x) + 1 > 2x + 7$. **3**

13. A square, OSQR, is shown below.

Q is the point $(8,8)$.



a) Write down the coordinates of the point R. **1**

The straight line TR intersects the y-axis at T$(0,12)$, and the x-axis at R.

b) Find the equation of the line TR. **3**

The line also crosses the line SQ at the point P.

c) Find the coordinates of P. **2**

[END OF QUESTION PAPER]