N5

NATIONAL

QUALIFICATIONS

Mark

**N5/I1**

Mathematics

Paper 1

1 HOUR

(Non-calculator)

Prelim Practice I

**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 $2\frac{1}{3}+\frac{5}{6}\times 1\frac{2}{5}$. **3**

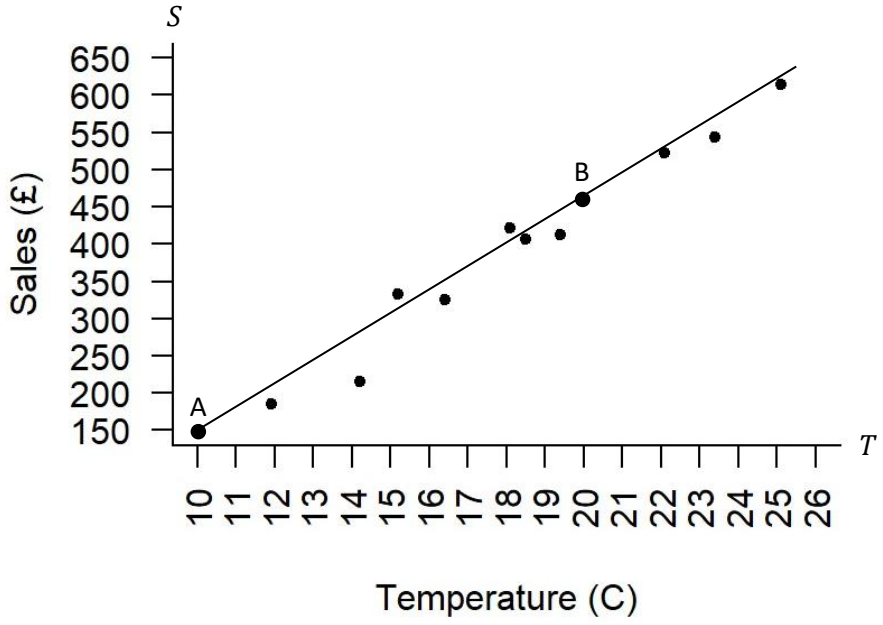
**2.** Solve the inequality $5-x>2(x+1)$. **2**

**3.** Factorise $2p^2-5p-12$ **2**

**4.** The diagram shows a scattergraph plotting temperature ($T$) against sales ($S$) for a seafront cafe.

Point A represents a day with a temperature of 10 degrees and sales of 150 pounds.

Point B represents a day with a temperature of 20 degrees and sales of 450 pounds.

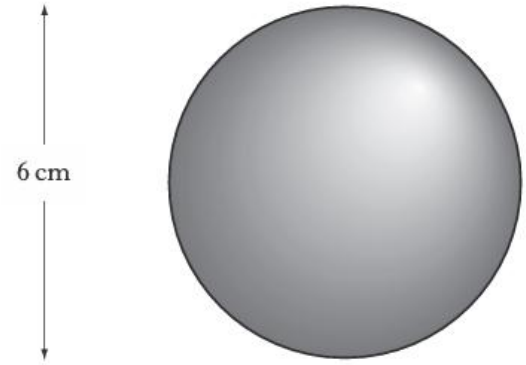



A line of best fit has been drawn on the scattergraph, which passes through the points A and B.

a) Determine the equation of the line of best fit in terms of $T$ and $S$. **3**

b) **Use your answer to part a)** to predict sales for a day with a temperature of 11 degrees. **1**

**5.** The diagram below represents a sphere.




The sphere has a diameter of 6 centimetres.

Calculate its volume.

**Take $\pi = 3.14$.** **2**

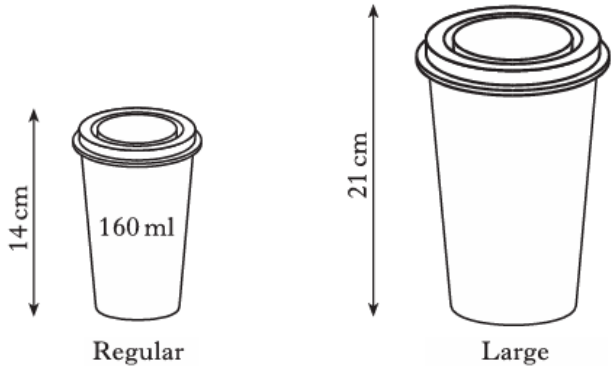
**6.** Solve algebraically the system of equations:

$$2x - 5y = 24$$

$$7x + 8y = 33$$ **3**

**7.** Coffee is sold in regular cups and large cups.

The two cups are mathematically similar in shape.




The regular cup is 14 centimetres high and holds 160 millimetres.

The large cup is 21 centimetres high.

Calculate how many millilitres the large cup holds. **4**

**8.** a) Show that the standard deviation of $1, 1, 1, 2$ and $5$ is $\sqrt{3}$. **3**

b) **State** the standard deviation of $101, 101, 101, 102$ and $105$. **1**

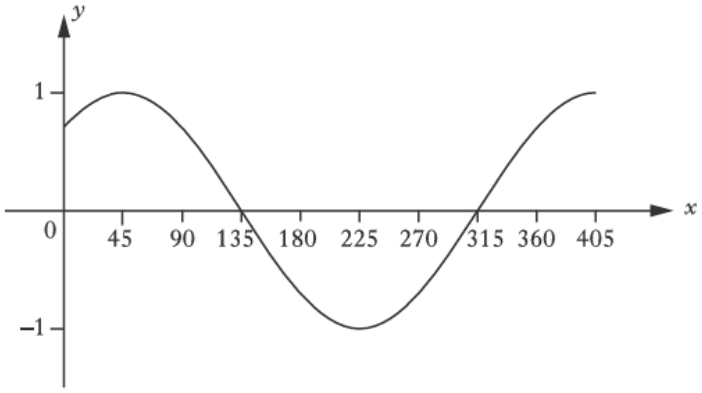
**9.** Cleano washing powder is on special offer.


Each box on special offer contains 20% more powder than the standard box.

A box on special offer contains 900 grams.

How many grams does the standard box hold? **3**

**10.** The graph shown below has an equation of the form $y = \cos(x - a)°$.




Write down the value of $a$. **1**

**11.** Express $\frac{12}{\sqrt{2}}$ with a rational denominator.

Give your answers in its simplest form. **2**

**12.** A straight line passes through the points $(4, -1)$ and $(k, 2)$.

The line has a gradient of 3.

Determine the value of $k$. **3**

**13.** Given that $f(x) = \sqrt{x + 2}$, evaluate $f(38)$.

Give your answer as a **simplified surd**. **2**

**14.** Factorise $27 - 3a^2$ fully. **2**

**15.** Simplify $\frac{h^4 \times 3h^5}{\left(\sqrt{h}\right)^4}$ **3**

**[END OF QUESTION PAPER]**