N5

Essential Skills

National 5

Mathematics

Practice Exam 2026

Paper 1 (Non-calculator)

Time 1 hour

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.

Use **blue** or **black** ink.

Marks available are harsh but I wanted as much course coverage as possible.

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 $A = \dfrac{1}{2}ab\sin C$

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

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

Attempt ALL questions
Total marks – 40

1. Evaluate $2\frac{4}{9} \div 1\frac{2}{3}$.

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

2. Expand and simplify $(x-3)(2x^2-3x+1)$. **3**

3. A function is defined as $f(x) = x^2 - x + 3$.

Given that $f(p) = 5$, find the value(s) of p. **3**

4. Express $\sqrt{18} + 4\sqrt{2} - \sqrt{50}$ **3**

5. The ages of 10 customers in a coffee shop are listed below.

13 16 16 17 21 29 36 45 49 51

Calculate the median and interquartile range of the ages. **3**

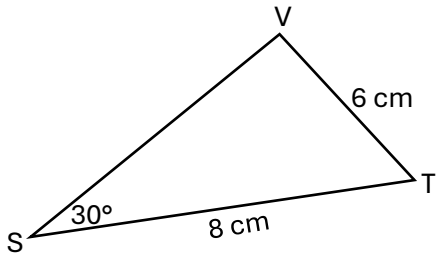
6. Write the following in order, starting with the smallest.

$\sin 60°$ $\sin 180°$ $\sin 330°$

Justify your answer. **2**

7. In triangle STV

- ST = 8 centimetres
- SV = 6 centimetres
- angle VST = 30°



Given that $sin30° = \frac{1}{2}$, show that $\sin SVT = \frac{2}{3}$. **3**

8. (a) Expand and simplify $x(x^{\frac{1}{2}} - x^{-1})$ **2**

(b) Hence, evaluate when $x = 9$. **2**

9. Given $\boldsymbol{a} = \begin{pmatrix} -1 \\ 2 \\ 0 \end{pmatrix}$ and $\boldsymbol{b} = \begin{pmatrix} 2 \\ 0 \\ -2 \end{pmatrix}$

Calculate $|2\boldsymbol{a} - \boldsymbol{b}|$. **3**

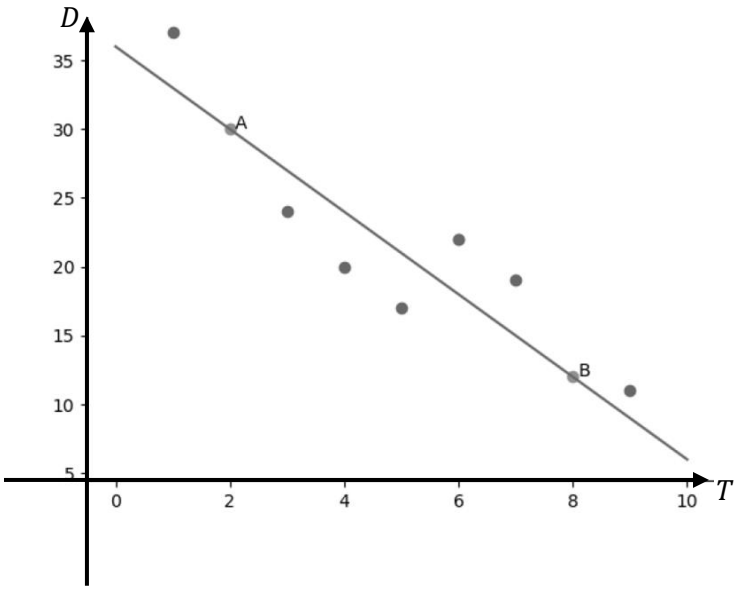
10. In a cycling race, riders start at separate times.

The scatter graph shows the relationship between the time spent cycling, T minutes, and the distance remaining to the finish, D kilometres.

A line of best fit has been drawn.

Point A represents a cyclist who has been cycling for 2 minutes and is 30 km from the finish.

Point B represents a cyclist who has been cycling for 8 minutes and is 12 km from the finish.



(a) Find the equation of the line of best fit in terms of D and T. **3**

(b) Use your equation to estimate how far a cyclist is from the finish after 5 minutes. **1**

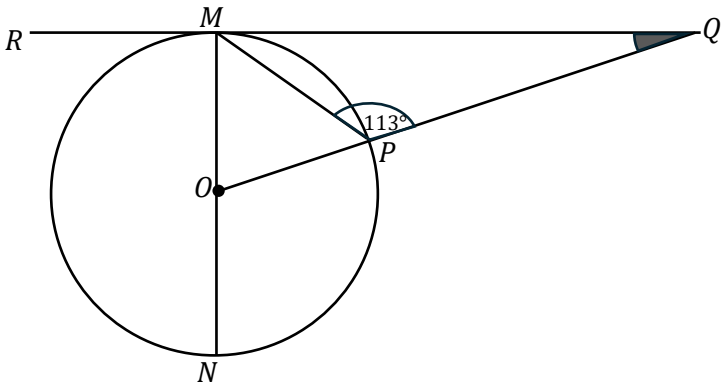
11. A parabola has equation $y = x^2 + 4x + 3$.

(a) Write the equation in the form $y = (x + a)^2 + b$. **2**

(b) Sketch the curve $y = x^2 + 4x + 3$, showing the coordinates of the turning point and the point of intersection with the y −axis. **2**

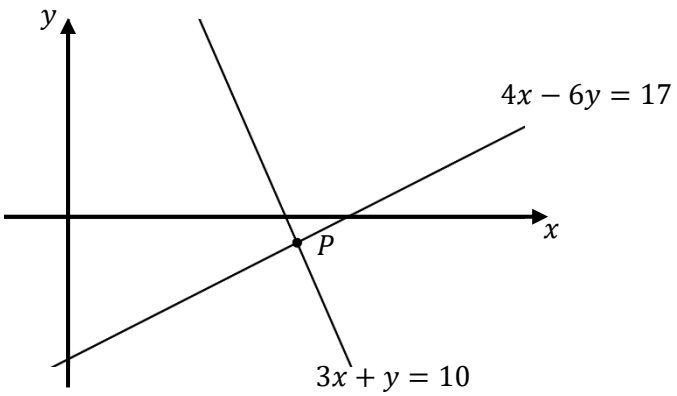
12. The diagram shows the circle with centre O.

- QR is a tangent at point M.
- MN is a diameter.
- Angle MPQ is 113°.



Calculate the size of shaded angle MQP. **3**

13. The diagram shows the straight lines $4x - 6y = 17$ and $3x + y = 10$.



Establish the coordinates of the point of intersection, P. **3**

[END OF QUESTION PAPER]