FOR OFFICIAL USE

N5 National Qualifications 2025

Mark

X847/75/01

Mathematics
Paper 1 (Non-calculator)

WEDNESDAY, 14 MAY
9:00 AM – 10:00 AM

X8477501

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth
Day Month Year

Scottish candidate number

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 booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

SQA

X8477501

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Total marks — 40

Attempt ALL questions

1. Evaluate $2\frac{4}{5} \times \frac{2}{7}$.

   Give your answer in its simplest form. 2

$$2\frac{4}{5} \times \frac{2}{7}$$
$$= \frac{14^{2}}{5} \times \frac{2}{7_{1}}$$
$$= \frac{4}{5}$$

2. Expand and simplify $(x+3)(x+5)+4(x-2)$. 3

	x	$+3$
x	x^2	$+3x$
$+5$	$+5x$	$+15$

$$(x+3)(x+5)+4(x-2)$$
$$= x^2+8x+15+4x-8$$
$$= x^2+12x+7$$

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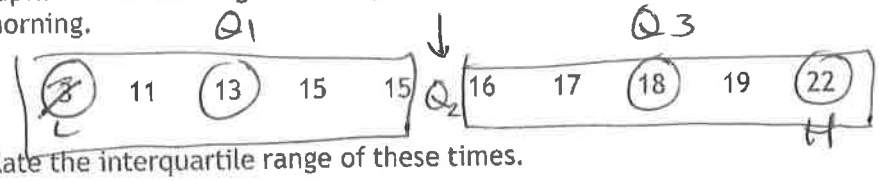
3. Ten pupils record the length of time, in minutes, it takes them to walk to school one morning.



Calculate the interquartile range of these times. 2

IQR = $Q_3 - Q_1$
= 18 − 13
= 5

4. In a sale, the price of a wedding dress is reduced by 20%.
The sale price of the dress is £720.
Calculate the price of the dress before the sale. 3

%	£
80	720
10	90
100	900

£900

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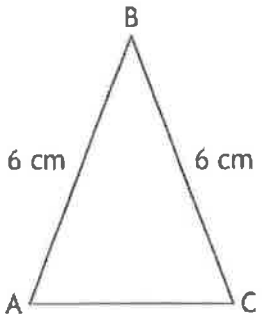
5. Triangle ABC is shown in the diagram.



- AB = BC = 6 centimetres.
- $\sin B = \frac{2}{3}$.

Calculate the area of the triangle. 2

Area $= \frac{1}{2}ac\sin B$

$\frac{1}{2}(6)(6)\left(\frac{2}{3}\right)$

$= \frac{2}{3}$ of 18

$= 12\text{ cm}^2$

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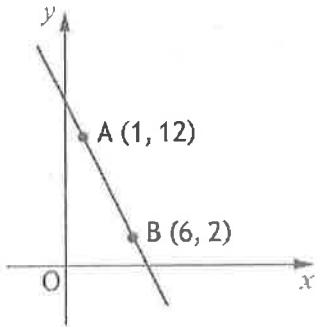
6. The diagram shows the straight line passing through points A and B.



Find the equation of the line AB.

Give the equation in its simplest form. 3

$M = \frac{12-2}{1-6}$

$= \frac{10}{-5}$

$= -2$

$y - 12 = -2(x-1)$

$y - 12 = -2x + 2$

$y = -2x + 14$

MARKS | DO NOT WRITE IN THIS MARGIN

7. A function is defined as $f(x) = 3x + 7$.

(a) Evaluate $f(6)$. 1

$f(6) = 3(6) + 7$

$= 18 + 7$

$= 25$

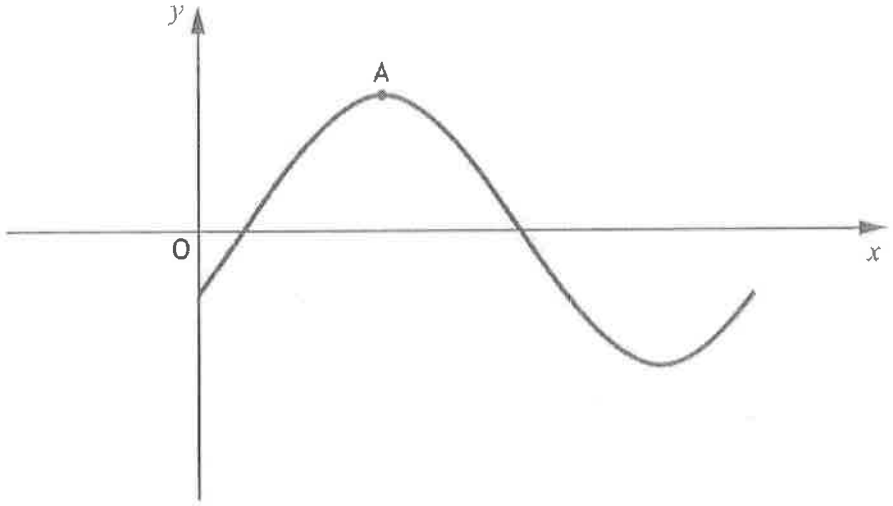
(b) Given that $f(p) = 19$, find the value of p. 2

$f(p) = 3p + 7 \quad \therefore 3p + 7 = 19$

$3p = 12$

$p = 4$

8. Part of the graph of $y = 2\sin(x - 30)°$ is shown in the diagram.



The graph has a maximum turning point at A.

State the coordinates of A. 2

shifted 30° right.

should be (90°, 2)

$\therefore$ (120°, 2)

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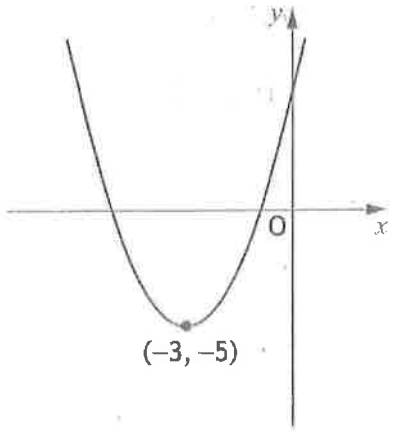
9. The diagram shows a parabola with equation of the form $y=(x+a)^2+b$.



(a) State the value of a. 1

$a=3$

(b) State the value of b. 1

$b=-5$

10. Simplify $\dfrac{n^7\times(n^3)^2}{n^4}$. 3

$$\frac{n^7 \times (n^3)^2}{n^4} = \frac{n^7 \times n^6}{n^4}$$

$$= \frac{n^{13}}{n^4}$$

$$= n^9$$

MARKS | DO NOT WRITE IN THIS MARGIN

11. Determine the nature of the roots of the function $f(x) = 3x^2 + 2x + 1$. 2

$a = 3$
$b = 2$
$c = 1$

$b^2 - 4ac$
$= 2^2 - 4(3)(1)$
$= 4 - 12$
$= -8$
$b^2 - 4ac < 0$ ∴ no real roots.

12. Express $\frac{6}{\sqrt{10}}$ with a rational denominator.

Give your answer in its simplest form. 2

$\frac{6}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}}$

$= \frac{6\sqrt{10}}{10}$

$= \frac{3\sqrt{10}}{5}$

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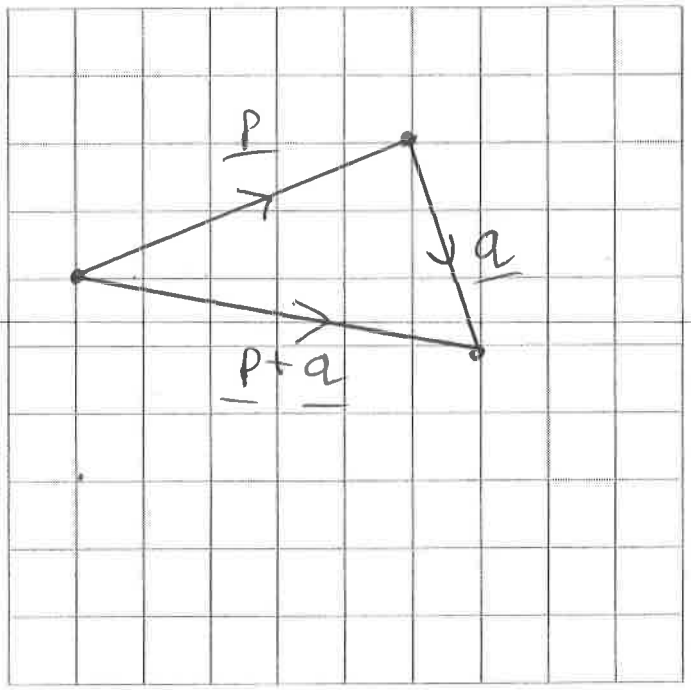
MARKS | DO NOT WRITE IN THIS MARGIN

13. Vectors $\mathbf{p}$ and $\mathbf{q}$ have components $\mathbf{p} = \begin{pmatrix} 5 \\ 2 \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} 1 \\ -3 \end{pmatrix}$.

Draw the resultant vector $\mathbf{p} + \mathbf{q}$ on the grid. **2**

(An additional grid, if required, can be found on *page 14*.)



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14. Express

$$\frac{5}{x-1} - \frac{4}{x}, \quad x \neq 1, \ x \neq 0$$

as a single fraction in its simplest form. 3

$$\frac{5}{x-1} - \frac{4}{x}$$

$$= \frac{5x - 4(x-1)}{x(x-1)}$$

$$= \frac{5x - 4x + 4}{x(x-1)}$$

$$= \frac{x+4}{x(x-1)}$$

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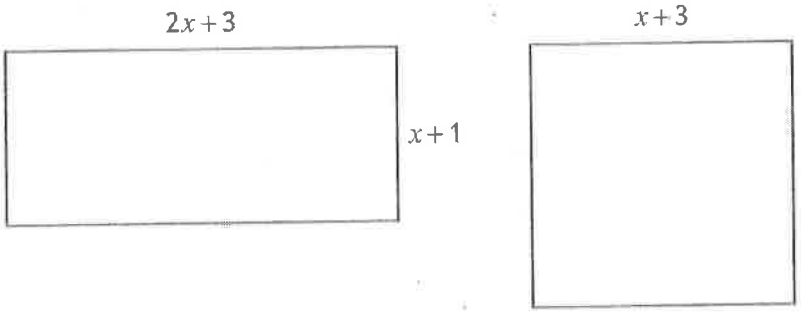
15. The diagrams of a rectangle and square are shown below.
All measurements are in centimetres.



(a) Find an expression for the area of the **rectangle**. 1

$A = (2x+3)(x+1)$

(b) Given that the area of the rectangle is equal to the area of the square, show that $x^2 - x - 6 = 0$. 2

$(2x+3)(x+1) = (x+3)(x+3)$

$2x^2 + 5x + 3 = x^2 + 6x + 9$

$x^2 - x - 6 = 0$

(as required)

	2x	+3
x	$2x^2$	+3x
+1	+2x	+3

	x	+3
x	x^2	+3x
+3	+3x	+9

MARKS | DO NOT WRITE IN THIS MARGIN

15. (continued)

(c) Hence find, algebraically, the length and breadth of the rectangle. 3

	x	-3
x	x^2	$-3x$
$+2$	$+2x$	-6

-6

$1 \quad 6$

$+2 \quad -3$

$x^2 - x - 6 = 0$

$(x-3)(x+2) = 0$

$x = 3, \quad x = -2$

[END OF QUESTION PAPER]