Bridging the Gap

'A' Level Mathematics Year 1

NON-CALCULATOR PAPER

April 2020

Candidates answer on the Question paper.

Materials required:

- Pen
- Pencil
- Ruler

Duration: 60 mins

Candidate forename		Candidate surname	

Teacher(s)		Class	

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Where space is provided below the question, please write your answer there.
- You may use additional paper, but you must clearly show your candidate number and question number(s).

INFORMATION FOR CANDIDATES

- **The number of marks is given in brackets** [ ] **at the end of each question or part question.**
- **The total number of marks for this paper is** 60**.**

Answer **all** the questions.

1. Work out.

$$1\frac{3}{4} + 3\frac{5}{12}$$

Give your answer as a mixed number in its simplest form.

..... **[3]**

2. Work out $\frac{2}{15} \times \frac{15}{22}$.

Give your answer in its lowest terms.

..... **[2]**

3. Write as a single power of x.

i. $x^6 \times x^2$

(i)..... **[1]**

ii. $x^9 \div x^3$

(ii)..... **[1]**

4. Factorise fully.

$4xy - 10xw$

..... **[2]**

5. Multiply out and simplify fully.

$(3x - 4)(2x + 1)$

..... **[3]**

6. Evaluate.

i. $3^0 + 4^{-1}$

(i)..... **[2]**

ii. $16^{\frac{3}{4}}$

(ii)..... **[2]**

7. Simplify.

$\left(\frac{a^5}{a^9}\right)^{-2}$

..... **[2]**

8. Solve.

$5x + 17 = x + 3$

x = ... **[3]**

9. Rearrange this formula to make a the subject.

$5(a + b) = 2ab$

..... **[4]**

10. Solve.

$$\frac{3x - 1}{5} = x - 2$$

x = ... **[3]**

11. Show that $\sqrt{396}$ can be written as $6\sqrt{11}$.

[2]

12. Multiply out and simplify.

$$(4 + \sqrt{3})(1 - \sqrt{3})$$

Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.
Show all your working.

..... **[3]**

13(a). Factorise.

$x^2 - 9$

..... **[1]**

(b). Factorise.

$x^2 - 4x + 3$

..... **[2]**

(c). Use your answers to parts **(a)** and **(b)** to simplify this expression.

$$\frac{x^2 - 4x + 3}{x^2 - 9}$$

..... **[1]**

14. Rationalise the denominator in this expression.

$$\frac{3 + \sqrt{2}}{\sqrt{2}}$$

..... **[2]**

15. Express as a single fraction in its simplest form.

$$\frac{4}{x-2} - \frac{5}{x+1}$$

..... **[3]**

16. Write the expression $x^2 - 10x + 10$ in the form $(x - a)^2 - b$.

..... **[3]**

17. Solve this equation.

$$3x^2 + 5x - 11 = 0$$

Leave your answers in SURD form.

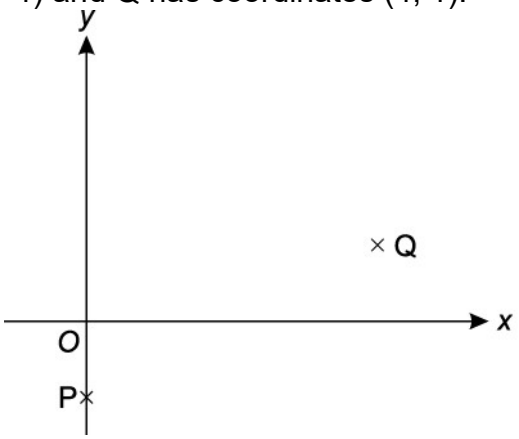
x = ... or x = ... **[3]**

18. Solve, algebraically, these simultaneous equations.

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

$x =$ .....
$y =$ ..... **[3]**

19. P has coordinates (0, −1) and Q has coordinates (4, 1).



Find the equation of line PQ.

..... **[3]**

20. Solve.

$y = 2x^2 + 16x - 9$
$y = 5x - 3$

$x =$ ..... $y =$ .....
$x =$ ..... $y =$ .....
[6]

END OF QUESTION paper