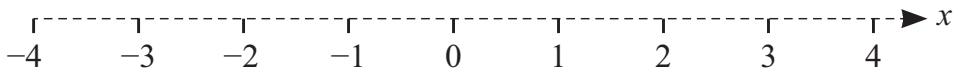
0607 International Mathematics Paper 2 - Algebra

Topical questions | 68 questions

1. Question | 0607 Feb-March 2025 P2 V2 Q2

2 Show the inequality $-2 < x \leqslant 3$ on the number line.



[2]

2. Question | 0607 Feb-March 2025 P2 V2 Q11

11 These are the first five terms of a sequence.

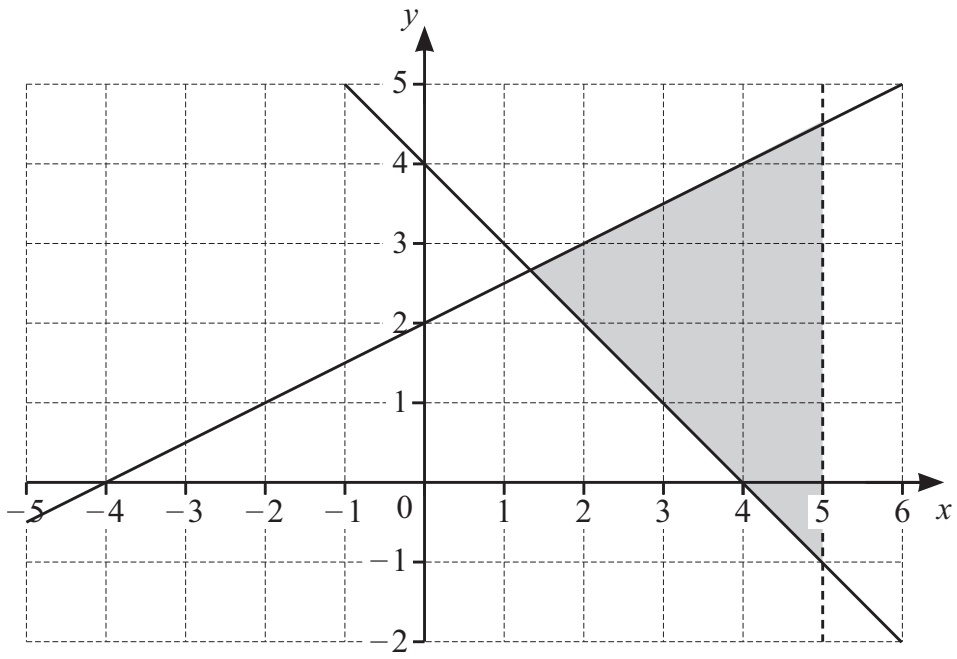
3 9 19 33 51

Find the nth term of this sequence.

..... [2]

3. Question | 0607 Feb-March 2025 P2 V2 Q13

13



Find the 3 inequalities that define the shaded region.

..... [4]

4. Question | 0607 Feb-March 2025 P2 V2 Q14

14 **(a)** Work out $(0.5)^2$.

..... [1]

(b) Work out $\sqrt[3]{64} \times 3^2$.

..... [2]

(c) $16^n = 2^{n-1}$

Find the value of n.

$n =$ ..... [2]

5. Question | 0607 Feb-March 2025 P2 V2 Q15

15 Expand and simplify.

$$(3a+4b)(a-2b)$$

..... [2]

6. Question | 0607 Feb-March 2025 P2 V2 Q18

18 **(a)** Rearrange the formula to make a the subject.

$$\sqrt{a-b} = 2c$$

$a =$ ..... [2]

(b) Rearrange the formula to make p the subject.

$$\frac{p-5}{3p-2} = q$$

$p =$ ..... [3]

7. Question | 0607 May-June 2025 P2 V1 Q9

9 Factorise.

(a) $4x^2y^3 - 6xy^4$

..... [2]

(b) $18p^2 - 2$

..... [2]

8. Question | 0607 May-June 2025 P2 V1 Q11

11 Solve.

$$7 - 3x > 2x - 8$$

..... [2]

9. Question | 0607 May-June 2025 P2 V1 Q14

14 These are the first 5 terms of a sequence.

1 7 17 31 49

(a) Find the next term of the sequence.

..... [1]

(b) Find an expression for the nth term of the sequence.

..... [2]

10. Question | 0607 May-June 2025 P2 V1 Q15

15 Solve.

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

$x =$ ..... or $x =$ ..... [3]

11. Question | 0607 May-June 2025 P2 V1 Q19

19 Expand and simplify.

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

..... [3]

12. Question | 0607 May-June 2025 P2 V1 Q21

21 y is inversely proportional to x^3.
$y = 1$ when $x = 2$.

(a) Find y in terms of x.

$y =$ ..... [2]

(b) Find x when $y = 27$.

$x =$ ..... [2]

13. Question | 0607 May-June 2025 P2 V2 Q8

8 **(a)** Expand and simplify.

$$5(2x-1)-3(3+4x)$$

..... [2]

(b) Factorise.

(i) $3y-y^2$

..... [1]

(ii) $8ax-3by+2ay-12bx$

..... [2]

(iii) $3x^2+5x-12$

..... [2]

14. Question | 0607 May-June 2025 P2 V2 Q11

11 Simplify.

$$(5x)^3 \div \left(\frac{1}{x}\right)^4$$

..... [2]

15. Question | 0607 May-June 2025 P2 V2 Q14

14 Find the lowest common multiple (LCM) of these expressions.

$2x^3y^4 \qquad 3x^2z^3 \qquad 4y^2z$

..... [2]

16. Question | 0607 May-June 2025 P2 V2 Q16

16 Find the next term and the nth term in each sequence.

(a) 12, 14, 16, 18, 20, ...

next term = ...

nth term = ... [3]

(b) 81, 27, 9, 3, 1, ...

next term = ...

nth term = ... [3]

17. Question | 0607 May-June 2025 P2 V2 Q18

18 Apples cost \$2.50 per kilogram.
The total cost of x kg of apples and y kg of pears is \$10 .

Find the cost of 1 kg of pears.
Give your answer in terms of x and y.

\$ ..... [3]

18. Question | 0607 May-June 2025 P2 V3 Q3

3 Simplify.

$$2x - 3y - x - 2y$$

..... [2]

19. Question | 0607 May-June 2025 P2 V3 Q6

6 The cost of a bar of chocolate is $\$c$.
The cost of a packet of sweets is $\$p$.

The total cost of 5 bars of chocolate and 2 packets of sweets is \$13.
The total cost of 7 bars of chocolate and 4 packets of sweets is \$20.

By forming a pair of simultaneous equations, find the cost of one bar of chocolate and the cost of one packet of sweets.

cost of one bar of chocolate = \$ .....

cost of one packet of sweets = \$ .....

[5]

20. Question | 0607 May-June 2025 P2 V3 Q15

15 $y^{2k} \times y^3 = \frac{1}{y}$

Find the value of k.

$k =$ ..... [2]

21. Question | 0607 May-June 2025 P2 V3 Q16

16 Rearrange $4y - 3x = 1 - py$ to write y in terms of p and x.

$y =$ ..... [2]

22. Question | 0607 May-June 2025 P2 V3 Q18

18 Solve.

$3(2x + 1) > 5 - 4x$

..... [3]

23. Question | 0607 May-June 2025 P2 V3 Q20

20 These are the first 5 terms of a sequence.

3 6 12 24 48

(a) Find the next term of the sequence.

..... [1]

(b) Find the nth term of the sequence.

..... [2]

24. Question | 0607 May-June 2025 P2 V3 Q22

22 Write as a single fraction in its simplest form.

$$2-\frac{3}{x-2}$$

..... [2]

Question 23 is printed on the next page.

25. Question | 0607 Oct-Nov 2025 P2 V1 Q8

8 Rearrange each formula to make b the subject.

(a) $c = \sqrt{5ab}$

$b =$ ..... [2]

(b) $P = \dfrac{3a+2b}{5a-b}$

$b =$ ..... [3]

26. Question | 0607 Oct-Nov 2025 P2 V1 Q10

10 Samina has two pieces of string.
The lengths of the two pieces of string are in the ratio 5 : 3.

Samina cuts 4 cm off each piece of string.
The lengths of the two remaining pieces of string are in the ratio 2 : 1.

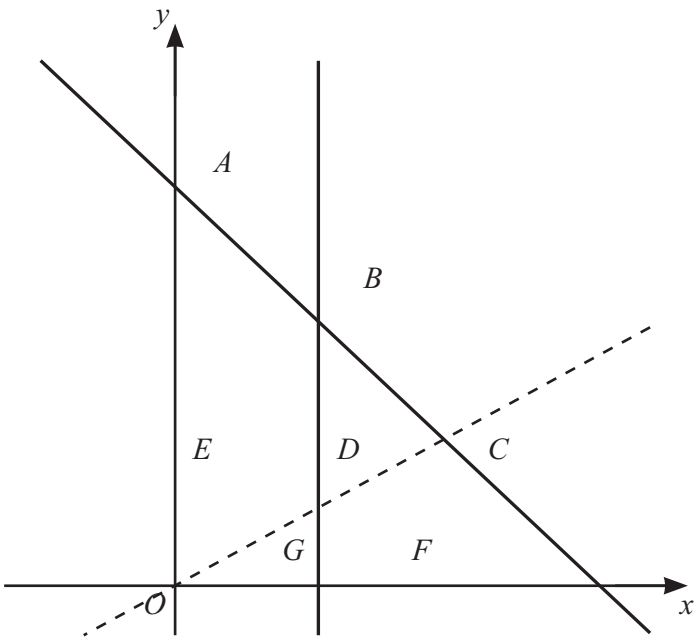
Find the original lengths of Samina's pieces of string.

..... cm

..... cm
[4]

27. Question | 0607 Oct-Nov 2025 P2 V1 Q14

14



The lines with equations $x = 2$, $y = \frac{1}{2}x$ and $x + y = 5$ are shown on the diagram.

These lines divide the space into 7 different regions A, B, C, D, E, F and G.

Write down the inequalities which define

(a) region A

..... [1]

(b) region C

..... [1]

(c) region E.

..... [2]

28. Question | 0607 Oct-Nov 2025 P2 V1 Q19

19 Simplify.

$$\frac{4a^2+4ab-15b^2}{2a^2+2ac-3ab-3bc}$$

..... [5]

29. Question | 0607 Oct-Nov 2025 P2 V2 Q2

2 Factorise.

$$9xy - 2x^2y^3$$

..... [2]

30. Question | 0607 Oct-Nov 2025 P2 V2 Q6

6 The cost of 5 burgers and 4 packets of fries is \$20.40 .
The cost of 1 packet of fries is \$1.10 .

Find the cost of 1 burger.

\$ ..... [3]

31. Question | 0607 Oct-Nov 2025 P2 V2 Q7

7 Find the next term and the nth term in this sequence.

82, 74, 66, 58, 50, …

next term = ...

nth term = ...

[3]

32. Question | 0607 Oct-Nov 2025 P2 V2 Q13

13 Solve the simultaneous equations.

$$\frac{1}{2}x - 3y = 27$$
$$3x + 2y = 2$$

$x =$ .....

$y =$ .....

[4]

33. Question | 0607 Oct-Nov 2025 P2 V2 Q20

20 **(a)** Factorise $4x^2 - 4x - 3$.

..... [2]

(b) Solve $4x^2 - 4x - 3 = 0$.

$x =$ ..... or $x =$ ..... [1]

(c) Solve $4(\cos x)^2 - 4\cos x - 3 = 0$ for $0° < x < 360°$.

$x =$ ..... or $x =$ ..... [3]

34. Question | 0607 Oct-Nov 2025 P2 V2 Q21

21 Simplify.

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

..... [3]

35. Question | 0607 Oct-Nov 2025 P2 V2 Q22

22 Make r the subject of $A + 4r = r^2 + 4$.

$r =$ ..... [4]

36. Question | 0607 Oct-Nov 2025 P2 V3 Q2

2 Solve.

$$7x + 3 = 3$$

$x =$ ..... [2]

37. Question | 0607 Oct-Nov 2025 P2 V3 Q4

4 Factorise.

$$5t - 15t^2$$

..... [2]

38. Question | 0607 Oct-Nov 2025 P2 V3 Q6

6 These are the first 5 terms of a sequence.

$$T_1 = 29 \qquad T_2 = 23 \qquad T_3 = 17 \qquad T_4 = 11 \qquad T_5 = 5$$

(a) Find T_6.

..... [1]

(b) Find T_n.

..... [2]

39. Question | 0607 Oct-Nov 2025 P2 V3 Q12

12 **(a)** Simplify $\left(x^3\right)^3$.

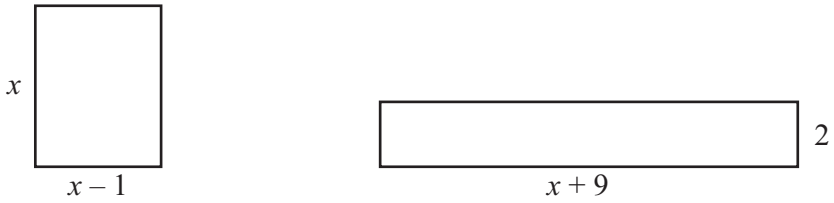
..... [1]

(b) Find the value of y when $2^{-y} = 4^{3-y}$.

$y =$ ..... [2]

40. Question | 0607 Oct-Nov 2025 P2 V3 Q15

15



NOT TO SCALE

The areas of the two rectangles are equal.

(a) Show that $x^2 - 3x - 18 = 0$.

[2]

(b) Factorise $x^2 - 3x - 18$.

..... [2]

(c) Find the difference between the perimeters of the two rectangles.

..... [3]

41. Question | 0607 Oct-Nov 2025 P2 V3 Q17

17 The solutions to the equation $x^2 + bx + c = 0$ are $-1 \pm \sqrt{5}$.

Find the value of b and the value of c.

$b =$ .....

$c =$ .....

[3]

42. Question | 0607 Oct-Nov 2025 P2 V3 Q19

19 Write as a single fraction in its simplest form.

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

..... [3]

43. Question | 0607 Specimen 2025 P2 Q7

7 In a bookshop, the price of each sports book is $\$x$ and the price of each recipe book is $\$y$.

Jamal buys 5 sports books and 3 recipe books.
The total Jamal pays is \$59.

Katerina buys 10 sports books and 7 recipe books.
The total Katerina pays is \$126.

(a) Use this information to write down two equations in terms of x and y.

.....

.....
[2]

(b) Solve your equations to find the value of x and the value of y.

$x =$ .....

$y =$ .....
[3]

(c) Li buys some sports books and recipe books and pays a total of \$37.

Find the number of sports books and the number of recipe books Li buys.

Number of sports books = ...

Number of recipe books = ...
[2]

44. Question | 0607 Specimen 2025 P2 Q9

9 $A = \pi r^2 + 2\pi rh$

Rearrange the formula to write h in terms of π, r and A.

$h =$ ..... [2]

45. Question | 0607 Specimen 2025 P2 Q11

11 These are the first four terms of a sequence.

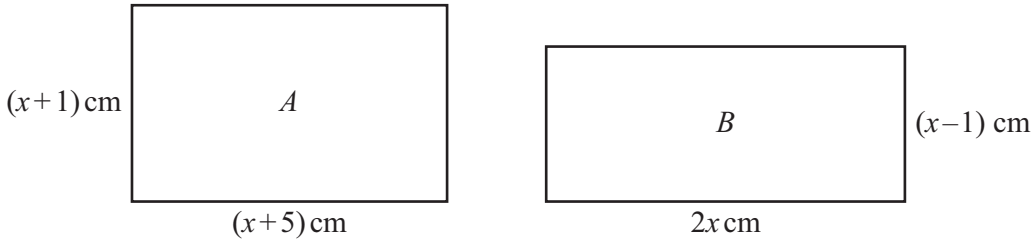
5, 10, 20, 40

Find the nth term of the sequence.

..... [2]

46. Question | 0607 Specimen 2025 P2 Q12

12



NOT TO SCALE

The area of rectangle B is $4\,\text{cm}^2$ greater than the area of rectangle A.

(a) Show that $x^2 - 8x - 9 = 0$.

[3]

(b) Find the value of x.

$x =$ ..... [2]

19 **(a)** Simplify $(32q^{15})^{\frac{2}{5}}$.

..... [2]

(b) Find the value of n when $9^n = 27$.

$n =$ ..... [2]

21 $y \propto \frac{1}{x^3}$

When $x = 2$, $y = 4$.

Find y in terms of x.

$y =$ ..... [2]

Question 22 is printed on the next page.

49. Question | 0607 Feb-March 2026 P2 V2 Q8

8 The cost to hire a boat is \$2 per hour plus a fixed fee of \$7.
Mosna has \$15.
Mosna hires a boat for x hours.

Write down and solve an inequality for the number of hours that Mosna can hire a boat.

..... [3]

50. Question | 0607 Feb-March 2026 P2 V2 Q9

9 Solve.

(a) $2x-3=6-4x$

$x =$ ..... [2]

(b) $(x+1)^2=9$

$x =$ ..... or $x =$ ..... [2]

51. Question | 0607 Feb-March 2026 P2 V2 Q13

13 Rearrange the formula to make x the subject.

$$y = \frac{ax+b}{x-c}$$

$x =$ ..... [4]

52. Question | 0607 Feb-March 2026 P2 V2 Q16

16 Simplify.

$$\frac{10x-2x^2}{x^2-25}$$

..... [3]

53. Question | 0607 Feb-March 2026 P2 V2 Q20

20 Solve by factorisation.

$$6x^2 - 13x - 5 = 0$$

$x =$ ..... or $x =$ ..... [3]

54. Question | 0607 May-June 2026 P2 V1 Q4

4 $H = 2W - 3X$

Find the value of W when $H = 4$ and $X = 2$.

$W =$ ..... [2]

55. Question | 0607 May-June 2026 P2 V1 Q9

9 Expand and simplify.

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

..... [2]

56. Question | 0607 May-June 2026 P2 V1 Q10

10 **(a)** Solve.

$$5(2n-3) = 40$$

$n =$ ..... [3]

(b) Solve the simultaneous equations.

$$5x - y = 18$$
$$x + 2y = 8$$

$x =$ .....

$y =$ ..... [3]

(c) Solve the inequality.

$$17 + 2n < 5n - 10$$

..... [2]

57. Question | 0607 May-June 2026 P2 V1 Q17

17 Find the highest common factor (HCF) of $16x^3y^4$ and $24x^2y^5$.

..... [2]

58. Question | 0607 May-June 2026 P2 V1 Q19

19 $3^{12} \div 3^n = 3^{2n}$

Find the value of n.

$n =$ ..... [2]

59. Question | 0607 May-June 2026 P2 V1 Q21

21 **(a)** Write as a single fraction in its simplest form.

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

..... [3]

(b) Simplify.

$$\frac{4x^2-9}{2x^2+5x-12}$$

..... [4]

60. Question | 0607 May-June 2026 P2 V2 Q8

8 $y = \dfrac{\sqrt[3]{t}}{w}$

(a) Find the value of y when $t = 27$ and $w = 9$.

$y =$ ..... [1]

(b) Rearrange the formula to write t in terms of w and y.

$t =$ ..... [2]

61. Question | 0607 May-June 2026 P2 V2 Q11

11 Solve.

$$\frac{t+1}{7} = \frac{4-t}{2}$$

$t =$ ..... [3]

62. Question | 0607 May-June 2026 P2 V2 Q13

13 Simplify.

(a) $\left(3y^3\right)^4$

..... [2]

(b) $\left(16x^{16}\right)^{\frac{1}{4}}$

..... [2]

63. Question | 0607 May-June 2026 P2 V2 Q18

18 A car journey has two stages.

Stage 1: 80 km at an average speed of x km/h
Stage 2: 450 km at an average speed of $(x+50)$ km/h

The journey takes a total of 7 hours.

(a) Show that $7x^2 - 180x - 4000 = 0$.

[3]

(b) By factorising $7x^2 - 180x - 4000$ find the value of x.

$x =$ ..... [3]

64. Question | 0607 May-June 2026 P2 V3 Q4

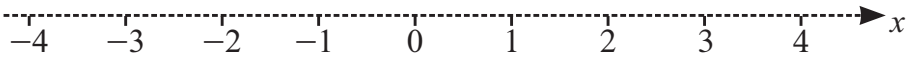
4 Simplify.

$9x - 2y + 3x + y$

..... [2]

65. Question | 0607 May-June 2026 P2 V3 Q6

6 On the number line, show the inequality $-3 \leqslant x < 2$.



[2]

66. Question | 0607 May-June 2026 P2 V3 Q9

9 Factorise.

(a) $2x^3y^4 - 3x^5y^3$

..... [2]

(b) $4x^2 - 5x - 6$

..... [3]

67. Question | 0607 May-June 2026 P2 V3 Q14

14 y varies directly as the square root of $(x-1)$.
$y = 15$ when $x = 26$.

Find y in terms of x.

$y =$ ..... [2]

68. Question | 0607 May-June 2026 P2 V3 Q18

18 Make x the subject of the formula.

$$A(2-x) = A - \frac{3(2x+1)}{B}$$

$x =$ ..... [4]

Question 19 is on the back page.