Sino Bright School Chongqing

Monthly Exam, 2025-2026 T1

Subject:	Pure Mathematics 1
Date:	Oct 2025
Time:	90 Minutes
Teacher:	Shi Feng

IMPORTANT: Read together before beginning the exam.

Students must complete the assessments to the best of their ability. Any students found cheating during an exam will be given a zero and referred to the Principal for further disciplinary measures. Cheating is a serious offense.

"Cheating" may include any of the following:

- Having course papers, notes, unapproved data sheets or other course-related materials in the exam room without the expressed permission of the subject class teacher in charge of the exam.
- Using or even having a cellphone or other electronic device in the exam room without the express permission of the subject class teacher in charge of the exam.
- Attempting to communicate, either verbally or non-verbally with other students during the exam.
- Having exam-related materials prior to the writing of the exam.

Mark Breakdown:	Student Name:
Part I: Multiple Choice Questions 2 Marks $\times$ 15 Part II: Short Answer Questions 2 Marks $\times$ 15 Part III: Long Answer Questions 40 Marks	
Total Score: 100	Score: _____

Special Instructions/Materials Allowed:

- Pen

Part I: Multiple Choice Questions (30 marks)

Choose the correct answer. Each question carries 2 marks.

1. Simplify the expression: $(2x^2)^3$

   (a) $6x^5$ (b) $8x^5$ (c) $6x^6$ (d) $8x^6$

2. What is the value of $8^{\frac{2}{3}}$?

   (a) 2 (b) 4 (c) 16 (d) 64

3. The simplified form of $\sqrt{48}$ is:

   (a) $4\sqrt{3}$ (b) $6\sqrt{2}$ (c) $8\sqrt{3}$ (d) $12\sqrt{2}$

4. Which is a factor of $x^2 - 5x + 6$?

   (a) $x + 2$ (b) $x - 3$ (c) $x + 6$ (d) $x - 1$

5. The solution to $2x - 5 = 11$ is:

   (a) $x = 3$ (b) $x = 6$ (c) $x = 8$ (d) $x = 13$

6. The graph of $y = x^2 - 4$ has its turning point at:

   (a) $(0, -4)$ (b) $(0, 4)$ (c) $(2, 0)$ (d) $(-2, 0)$

7. What is the discriminant of $x^2 + 4x + 4 = 0$?

   (a) 0 (b) 4 (c) 8 (d) 16

8. The simplified form of $\frac{3}{\sqrt{2}}$ is:

   (a) $\frac{3\sqrt{2}}{2}$ (b) $\frac{\sqrt{6}}{2}$ (c) $\frac{3}{2}\sqrt{2}$ (d) $\sqrt{6}$

9. Which represents a translation of $y = x^2$ by $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$?

   (a) $y = (x + 3)^2$ (b) $y = x^2 + 3$ (c) $y = (x - 3)^2$ (d) $y = x^2 - 3$

10. The solution set for $x^2 - 9 < 0$ is:

    (a) $x < -3$ (b) $x > 3$ (c) $-3 < x < 3$ (d) $x < -3$ or $x > 3$

11. The function $f(x) = x^2 + 2x + 1$ has:

(a) Two distinct real roots (b) One repeated real root (c) No real roots (d) A maximum point

12. Simplify: $(3x^2y)(4xy^3)$

(a) $7x^3y^4$ (b) $12x^2y^3$ (c) $12x^3y^4$ (d) $7x^2y^3$

13. The value of $16^{-\frac{1}{2}}$ is:

(a) -4 (b) $\frac{1}{4}$ (c) 4 (d) $-\frac{1}{4}$

14. Which is equivalent to $\sqrt{20} + \sqrt{45}$?

(a) $5\sqrt{5}$ (b) $13\sqrt{5}$ (c) $5\sqrt{13}$ (d) $6\sqrt{5}$

Part II: Short Answer Questions (40 marks)

True or False (20 marks)

State whether each statement is True or False. Each question carries 2 marks.

1. **True/False:** $\sqrt{9+16} = \sqrt{9} + \sqrt{16}$
2. **True/False:** $(x+2)^2 = x^2 + 4$
3. **True/False:** The expression $\frac{x^2-4}{x-2}$ simplifies to $x+2$ for all $x \neq 2$
4. **True/False:** $2^{-3} = -8$
5. **True/False:** The quadratic formula is $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
6. **True/False:** $y = (x-3)^2$ has its minimum point at $(3, 0)$
7. **True/False:** $\frac{1}{x^{-2}} = x^2$
8. **True/False:** The inequality $x^2 + 1 < 0$ has real solutions
9. **True/False:** $27^{\frac{2}{3}} = 9$
10. **True/False:** The graph of $y = \frac{1}{x}$ has asymptotes at $x = 0$ and $y = 0$

Fill in the Blanks (20 marks)

Complete each statement. Each blank carries 2 marks.

1. The solutions to $x^2 - 5x + 6 = 0$ are _____ and _____
2. Complete the square: $x^2 + 6x + 1 = (x + \_\_\_\_)^2 - \_\_\_\_$
3. Simplify $\frac{6x^3y^2}{2xy} =$ _____
4. The discriminant of $2x^2 - 3x + 1 = 0$ is _____

5. Rationalize: $\frac{5}{\sqrt{3}} =$ _____

6. The turning point of $y = x^2 - 4x + 3$ is at (_____, _____)

7. $8^{\frac{1}{3}} =$ _____

8. The factors of $x^2 - 9$ are _____ and _____

9. The range of $y = x^2 + 2$ is _____

10. The translation that maps $y = x^2$ to $y = (x - 2)^2 + 3$ is by vector _____

Part III: Long Answer Questions (30 marks)

Show your working for each question.

1. (a) Simplify: $\frac{2x^2-8}{x^2-4x+4}$ (3 marks)
   (b) Expand and simplify: $(2x - 3)(x + 4) - (x - 2)^2$ (3 marks)

2. (a) Solve by factorization: $x^2 - 7x + 12 = 0$ (3 marks)
   (b) Solve using the quadratic formula: $2x^2 - 5x - 3 = 0$ (3 marks)

3. (a) Sketch the graph of $y = x^2 - 4$, showing intercepts with axes (3 marks)

   (b) Find the coordinates of the turning point of $y = x^2 + 6x + 1$ (3 marks)

4. (a) Simplify: $\sqrt{50} + \sqrt{18} - \sqrt{8}$ (3 marks)

   (b) Evaluate: $16^{\frac{3}{4}} + 8^{-\frac{2}{3}}$ (3 marks)

5. Sketch the graph of the following equations, clearly showing X and Y intercepts. (6 marks)

   (a) $y = x(x - 2)(x + 3)$ (3 marks)

   (b) $y = (x + 1)^2(2 - x)$ (3 marks)