MATH LOVE INSTITUTE

Annual Examination 2025-26

Class: VII | Subject: Mathematics | Paper 5

Time: 3 Hours | Maximum Marks: 80

Student Name:	_____
Roll Number:	_____
Date:	_____

General Instructions:

1. All questions are compulsory.
2. The question paper is divided into 5 sections: A, B, C, D, and E.
3. Section A: Multiple Choice Questions (1 mark each) - 15 marks
4. Section B: Fill in the Blanks / True-False (1 mark each) - 15 marks
5. Section C: Short Answer Questions (2 marks each) - 20 marks
6. Section D: Long Answer Questions (3 marks each) - 15 marks
7. Section E: Application Based Questions (5 marks each) - 15 marks
8. There is no negative marking.
9. Use of calculators is not allowed.
10. Show all necessary working clearly.

Covering Topics: Ch 8: Rational Numbers | Ch 3: Data Handling | Ch 7: Comparing Quantities | Ch 9: Perimeter and Area | Ch 11: Exponents and Powers | Ch 10: Algebraic Expressions | Ch 13: Visualising Solid Shapes

SECTION A - MULTIPLE CHOICE QUESTIONS (15 × 1 = 15 marks)

Q1. The additive inverse of -5/8 is: **[1 mark]**

(a) 8/5

(b) -8/5

(c) 5/8

(d) -5/8

Q2. Which of the following rational numbers lies between -1 and 0? **[1 mark]**

(a) -3/2

(b) -1/2

(c) 1/2

(d) 3/2

Q3. The value of 5^{-2} is: **[1 mark]**

(a) -25

(b) 1/25

(c) -10

(d) 25

Q4. Which term is a trinomial? **[1 mark]**

(a) 5x + 3

(b) $x^2 + 2x + 5$

(c) 7x

(d) $x^2 + 5x - 3y + 7$

Q5. The degree of the polynomial $3x^3 + 5x^2 - 7x + 2$ is: **[1 mark]**

(a) 2

(b) 3

(c) 5

(d) 7

Q6. If a shirt is marked at ₹800 and sold at ₹640, the discount percentage is: **[1 mark]**

(a) 10%

(b) 15%

(c) 20%

(d) 25%

Q7. The circumference of a circle with diameter 14 cm is: (Use π = 22/7) **[1 mark]**

(a) 22 cm

(b) 44 cm

(c) 88 cm

(d) 154 cm

Q8. The area of a parallelogram with base 10 cm and height 6 cm is: **[1 mark]**

(a) 16 cm^2

(b) 32 cm^2

(c) 60 cm^2

(d) 120 cm^2

Q9. 10^{-3} in standard form equals: **[1 mark]**

(a) 0.1

(b) 0.01

(c) 0.001

(d) 0.0001

Q10. Simplify: $(a^3)^4$ **[1 mark]**

(a) a^7

(b) a^{12}

(c) a^{64}

(d) a^{81}

Q11. The mode of the data: 5, 7, 5, 9, 5, 6, 7, 5 is: **[1 mark]**

(a) 5

(b) 6

(c) 7

(d) 9

Q12. A sphere has: **[1 mark]**

(a) 0 vertices, 0 edges

(b) 1 vertex, 0 edges

(c) 0 vertices, 1 edge

(d) 1 vertex, 1 edge

Q13. The reciprocal of (-7/9) is: **[1 mark]**

(a) 7/9

(b) 9/7

(c) -9/7

(d) -7/9

Q14. Simple Interest on ₹5,000 at 8% per annum for 2 years is: **[1 mark]**

(a) ₹400

(b) ₹600

(c) ₹800

(d) ₹1,000

Q15. The area of a triangle with base 8 cm and height 5 cm is: **[1 mark]**

(a) 13 cm²

(b) 20 cm²

(c) 40 cm²

(d) 80 cm²

SECTION B - FILL IN THE BLANKS / TRUE-FALSE (15 × 1 = 15 marks)

Q16. The product of a rational number and its reciprocal is _____. **[1 mark]**

Q17. Two rational numbers with different denominators can be added by finding their _____. **[1 mark]**

Q18. Any number raised to power zero equals _____. **[1 mark]**

Q19. In the expression $7x^2 - 3x + 5$, the degree is _____. **[1 mark]**

Q20. The sum of $3x + 5$ and $2x - 3$ is _____. **[1 mark]**

Q21. If the median of 3, 5, 7, 9, x is 7, then x = _____. **[1 mark]**

Q22. The formula for circumference of a circle is _____. **[1 mark]**

Q23. A cylinder has _____ vertices. **[1 mark]**

Q24. True or False: Every whole number is a rational number. **[1 mark]**

Q25. True or False: (-3/7) + (3/7) = 0 **[1 mark]**

Q26. True or False: $a^0 = 0$ for any value of a. **[1 mark]**

Q27. True or False: The mode is always unique in a dataset. **[1 mark]**

Q28. True or False: Selling Price = Cost Price - Loss **[1 mark]**

Q29. True or False: Perimeter of rectangle = 2 × (length + breadth) **[1 mark]**

Q30. True or False: A cube has 6 faces, 12 edges and 8 vertices. **[1 mark]**

SECTION C - SHORT ANSWER QUESTIONS (10 × 2 = 20 marks)

Q31. Subtract: 7/12 - 5/12 **[2 marks]**

Q32. Simplify: 8y - 3y + 2y **[2 marks]**

Q33. Evaluate: $7^2 \times 7^3$ **[2 marks]**

Q34. Find the area of a rectangle with length 18 cm and breadth 12 cm. **[2 marks]**

Q35. Convert 0.75 into a fraction in its simplest form. **[2 marks]**

Q36. Find the median of: 8, 12, 15, 18, 20, 25 **[2 marks]**

Q37. Multiply: (2/5) × (-15/8) **[2 marks]**

Q38. Express 0.000064 in standard form. **[2 marks]**

Q39. Subtract 3x - 2 from 7x + 5. **[2 marks]**

Q40. Find the circumference of a circle with radius 21 cm. (Use $\pi = 22/7$) **[2 marks]**

SECTION D - LONG ANSWER QUESTIONS (5 × 3 = 15 marks)

Q41. Arrange the following rational numbers in ascending order: **[3 marks]**

-3/4, 5/8, -7/12, 2/3

Q42. Simplify: $(5^2 \times 5^4 \times 5^3) \div 5^6$ **[3 marks]**

Q43. Subtract the following algebraic expressions: **[3 marks]**

$(5x^2 - 3x + 7) - (2x^2 + 4x - 5)$

Q44. The marks of 8 students in a Mathematics test are: **[3 marks]**

72, 85, 68, 90, 78, 82, 75, 88

Find: (a) Mean (b) Median (c) Range

Q45. A circular park has a radius of 35 m. Find: **[3 marks]**

(a) Circumference of the park

(b) Area of the park

(Use π = 22/7)

SECTION E - APPLICATION BASED QUESTIONS (3 × 5 = 15 marks)

Q46. A shopkeeper purchased a refrigerator for ₹12,000. He wants to make a profit of 15%. **[5 marks]**

(a) What should be the selling price?

(b) If he offers a 5% discount on the marked price (selling price), what will be the final selling price?

(c) What will be his actual profit in rupees after giving the discount?

(d) What is the profit percentage after discount?

Q47. The following table shows the production of wheat (in tonnes) by two farmers in 6 months: **[5 marks]**

Month	Farmer A	Farmer B
January	45	40
February	50	48
March	55	52
April	60	58
May	52	55
June	48	50

(a) Draw a double bar graph to represent this data.

(b) In which month did Farmer A produce more than Farmer B?

(c) Find the total production of each farmer.

(d) Who produced more wheat overall and by how much?

Q48. A rectangular field is 80 m long and 60 m wide. Inside it, there is a path of width 5 m running along its perimeter. **[5 marks]**

(a) Find the area of the field.

(b) Find the area of the path.

(c) Find the area of the remaining field (excluding the path).

(d) If grass is to be grown in the remaining area at the rate of ₹15 per m², find the total cost.

ANSWER KEY WITH SOLUTIONS

SECTION A - MCQ ANSWERS

Answer 1: (c) 5/8

Solution: The additive inverse of a number is the number that when added to it gives zero.

```
Additive inverse of -5/8 = 5/8
Check: (-5/8) + (5/8) = 0 ✓
```

Marking: 1 mark for correct answer

Answer 2: (b) -1/2

Solution: A rational number between -1 and 0 must be negative but greater than -1.

```
-1/2 = -0.5
Since -1 < -0.5 < 0, the answer is -1/2
```

Marking: 1 mark for correct answer

Answer 3: (b) 1/25

Solution:

```
5⁻² = 1/5²
= 1/25

Using the law: a⁻ⁿ = 1/aⁿ
```

Marking: 1 mark for correct answer

Answer 4: (b) $x^2 + 2x + 5$

Solution: A trinomial is an algebraic expression with exactly three terms.

• 5x + 3 → binomial (2 terms)

• $x^2 + 2x + 5$ → trinomial (3 terms) ✓

• 7x → monomial (1 term)

• $x^2 + 5x - 3y + 7$ → polynomial (4 terms)

Marking: 1 mark for correct answer

Answer 5: (b) 3

Solution: The degree of a polynomial is the highest power of the variable.

```
In 3x³ + 5x² - 7x + 2:
Highest power of x = 3
Therefore, degree = 3
```

Marking: 1 mark for correct answer

Answer 6: (c) 20%

Solution:

```
Marked Price = ₹800
Selling Price = ₹640
Discount = 800 - 640 = ₹160

Discount % = (Discount/Marked Price) × 100
= (160/800) × 100
= 20%
```

Marking: 1 mark for correct answer

Answer 7: (b) 44 cm

Solution:

```
Circumference = πd
= (22/7) × 14
= 22 × 2
= 44 cm
```

Marking: 1 mark for correct answer

Answer 8: (c) 60 cm²

Solution:

```
Area of parallelogram = base × height
= 10 × 6
= 60 cm²
```

Marking: 1 mark for correct answer

Answer 9: (c) 0.001

Solution:

```
10⁻³ = 1/10³
= 1/1000
= 0.001
```

Marking: 1 mark for correct answer

Answer 10: (b) a^{12}

Solution:

```
Using law: (a^m)^n = a^mn

(a^3)^4 = a^3x4 = a^12
```

Marking: 1 mark for correct answer

Answer 11: (a) 5

Solution:

```
Data: 5, 7, 5, 9, 5, 6, 7, 5

Frequency count:
5 appears 4 times
7 appears 2 times
6 appears 1 time
9 appears 1 time

Mode = 5 (most frequent value)
```

Marking: 1 mark for correct answer

Answer 12: (a) 0 vertices, 0 edges

Solution: A sphere is a perfectly round 3D shape with:

• 0 vertices (no corners)

• 0 edges (no straight lines)

• 1 curved surface

Marking: 1 mark for correct answer

Answer 13: (c) -9/7

Solution:

```
Reciprocal of a/b = b/a

Reciprocal of -7/9 = -9/7

Check: (-7/9) × (-9/7) = 1 ✓
```

Marking: 1 mark for correct answer

Answer 14: (c) ₹800

Solution:

```
SI = (P × R × T) / 100
= (5000 × 8 × 2) / 100
= 80000 / 100
= ₹800
```

Marking: 1 mark for correct answer

Answer 15: (b) 20 cm²

Solution:

```
Area of triangle = (1/2) × base × height
= (1/2) × 8 × 5
= 4 × 5
= 20 cm²
```

Marking: 1 mark for correct answer

SECTION B - FILL IN THE BLANKS / TRUE-FALSE ANSWERS

Answer 16: 1

Explanation:

```
For any rational number a/b (where b ≠ 0):
(a/b) × (b/a) = 1

The product of a number and its reciprocal is always 1.
```

Marking: 1 mark for correct answer

Answer 17: LCM (Least Common Multiple)

Explanation: To add or subtract rational numbers with different denominators, we need to find the LCM of the denominators to make them equal.

```
Example: 1/3 + 1/4
LCM of 3 and 4 = 12
= 4/12 + 3/12 = 7/12
```

Marking: 1 mark for correct answer

Answer 18: 1

Solution:

```
For any non-zero number a:
a⁰ = 1

Examples: 5⁰ = 1, 100⁰ = 1, (-3)⁰ = 1
```

Marking: 1 mark for correct answer

Answer 19: 2

Solution: The degree of an algebraic expression is the highest power of the variable.

```
In 7x² - 3x + 5:
Terms: 7x², -3x, 5
Powers: 2, 1, 0
Highest power = 2
Therefore, degree = 2
```

Marking: 1 mark for correct answer

Answer 20: 5x + 2

Solution:

```
(3x + 5) + (2x - 3)
= 3x + 5 + 2x - 3
= 3x + 2x + 5 - 3
= 5x + 2
```

Marking: 1 mark for correct answer

Answer 21: 7 (or any value, as median is already 7)

Solution:

```
Data: 3, 5, 7, 9, x
Given: Median = 7

If we arrange in ascending order and x ≥ 7:
3, 5, 7, 9, x → Median = 7 ✓

So x can be any value ≥ 7. Most likely x = 7 or higher.
```

Marking: 1 mark for correct answer

Answer 22: 2πr or πd

Explanation: The circumference of a circle can be expressed as:

```
C = 2πr (where r is radius)
or
C = πd (where d is diameter)

Since diameter = 2 × radius
```

Marking: 1 mark for correct answer

Answer 23: 0

Solution: A cylinder has:

• 2 circular faces (top and bottom)

• 1 curved surface

• 2 circular edges

• 0 vertices (no corners/points)

Marking: 1 mark for correct answer

Answer 24: True

Solution:

```
Every whole number can be written as a rational number.
Examples:
0 = 0/1
5 = 5/1
100 = 100/1

All whole numbers are rational numbers. ✓
```

Marking: 1 mark for correct answer

Answer 25: True

Solution:

```
(-3/7) + (3/7)
= (-3 + 3)/7
= 0/7
= 0 ✓

These are additive inverses of each other.
```

Marking: 1 mark for correct answer

Answer 26: False

Solution:

```
For any non-zero number a:
a⁰ = 1 (not 0)

Examples:
5⁰ = 1
10⁰ = 1
(-3)⁰ = 1

Note: 0⁰ is undefined.
```

Marking: 1 mark for correct answer

Answer 27: False

Solution: A dataset can have:

• No mode (all values appear once)

• One mode (unimodal)

• Two modes (bimodal)

• More than two modes (multimodal)

```
Example of bimodal data:
1, 2, 2, 3, 4, 4, 5
Modes: 2 and 4 (both appear twice)
```

Marking: 1 mark for correct answer

Answer 28: True

Solution: When there is a loss in a transaction:

```
Selling Price = Cost Price - Loss

Or equivalently:
Loss = Cost Price - Selling Price

Both formulas are correct. ✓
```

Marking: 1 mark for correct answer

Answer 29: True

Solution:

```
Perimeter of rectangle = Sum of all sides
= length + breadth + length + breadth
= 2 × length + 2 × breadth
= 2(length + breadth) ✓
```

Marking: 1 mark for correct answer

Answer 30: True

Solution: A cube has:

• 6 square faces ✓

• 12 edges ✓

• 8 vertices (corners) ✓

Marking: 1 mark for correct answer

SECTION C - SHORT ANSWER QUESTIONS (2 marks each)

Answer 31:

Solution:

```
7/12 - 5/12
(Denominators are same, subtract numerators)
= (7 - 5)/12
= 2/12

Simplify by dividing by 2:
= 1/6
```

Marking: 1 mark for subtraction, 1 mark for simplification

Answer 32:

Solution:

```
8y - 3y + 2y
(Combine like terms)
= (8 - 3 + 2)y
= 7y
```

Marking: 1 mark for combining terms, 1 mark for correct answer

Answer 33:

Solution:

```
Using law: a^m × a^n = a^(m+n)

7² × 7³ = 7^(2+3)
= 7⁵
= 16,807
```

Marking: 1 mark for using law, 1 mark for calculation

Answer 34:

Solution:

```
Given:
Length = 18 cm
Breadth = 12 cm

Area of rectangle = length × breadth
= 18 × 12
= 216 cm²
```

Marking: 1 mark for formula, 1 mark for calculation

Answer 35:

Solution:

```
0.75 = 75/100

Simplify by dividing by 25:
= (75÷25)/(100÷25)
= 3/4

Therefore, 0.75 = 3/4
```

Marking: 1 mark for conversion, 1 mark for simplification

Answer 36:

Solution:

```
Data: 8, 12, 15, 18, 20, 25 (already in order)
Number of observations (n) = 6 (even)

Median = Average of 3rd and 4th terms
= (15 + 18)/2
= 33/2
= 16.5
```

Marking: 1 mark for identifying middle terms, 1 mark for calculation

Answer 37:

Solution:

```
(2/5) × (-15/8)
= (2 × -15)/(5 × 8)
= -30/40

Simplify by dividing by 10:
= -3/4
```

Marking: 1 mark for multiplication, 1 mark for simplification

Answer 38:

Solution:

$0.000064 = 64/1,000,000$

$= 64 \times 10^{-6}$

$= 6.4 \times 10 \times 10^{-6}$

$= 6.4 \times 10^{-5}$

Standard form: 6.4×10^{-5}

Marking: 1 mark for conversion, 1 mark for standard form

Answer 39:

Solution:

Subtract (3x - 2) from (7x + 5):

$= (7x + 5) - (3x - 2)$

$= 7x + 5 - 3x + 2$

$= 7x - 3x + 5 + 2$

$= 4x + 7$

Marking: 1 mark for setting up, 1 mark for correct answer

Answer 40:

Solution:

Given: Radius (r) = 21 cm

Circumference = $2\pi r$

$= 2 \times (22/7) \times 21$

$= 2 \times 22 \times 3$

$= 132$ cm

Marking: 1 mark for formula, 1 mark for calculation

SECTION D - LONG ANSWER QUESTIONS (3 marks each)

Answer 41:

Solution:

```
Given: -3/4, 5/8, -7/12, 2/3

Step 1: Find LCM of denominators (4, 8, 12, 3)
LCM = 24

Step 2: Convert all to denominator 24
-3/4 = -18/24
5/8 = 15/24
-7/12 = -14/24
2/3 = 16/24

Step 3: Arrange in ascending order
-18/24 < -14/24 < 15/24 < 16/24

Answer: -3/4 < -7/12 < 5/8 < 2/3
```

Marking: 1 mark for finding LCM, 1 mark for conversion, 1 mark for ordering

Answer 42:

Solution:

```
Simplify: (5² × 5⁴ × 5³) ÷ 5⁶

Step 1: Multiply in numerator using aᵐ × aⁿ = aᵐ⁺ⁿ
= 5²⁺⁴⁺³ ÷ 5⁶
= 5⁹ ÷ 5⁶

Step 2: Divide using aᵐ ÷ aⁿ = aᵐ⁻ⁿ
= 5⁹⁻⁶
= 5³

Step 3: Calculate
= 125
```

Marking: 1 mark for multiplication rule, 1 mark for division rule, 1 mark for final answer

Answer 43:

Solution:

```
Subtract: (5x² - 3x + 7) - (2x² + 4x - 5)

Step 1: Remove parentheses (change signs in second
expression)
= 5x² - 3x + 7 - 2x² - 4x + 5

Step 2: Group like terms
= 5x² - 2x² - 3x - 4x + 7 + 5

Step 3: Combine
= 3x² - 7x + 12

Answer: 3x² - 7x + 12
```

Marking: 1 mark for removing brackets, 1 mark for grouping, 1 mark for final answer

Answer 44:

Solution:

```
Data: 72, 85, 68, 90, 78, 82, 75, 88

(a) Mean:
Sum = 72 + 85 + 68 + 90 + 78 + 82 + 75 + 88 = 638
Number of students = 8
Mean = 638 ÷ 8 = 79.75

(b) Median:
Arrange in order: 68, 72, 75, 78, 82, 85, 88, 90
n = 8 (even)
```

```
Median = Average of 4th and 5th terms
= (78 + 82) ÷ 2 = 80

(c) Range:
Maximum = 90
Minimum = 68
Range = 90 - 68 = 22

Answers: Mean = 79.75, Median = 80, Range = 22
```

Marking: 1 mark each for mean, median, and range

Answer 45:

Solution:

```
Given: Radius (r) = 35 m

(a) Circumference:
C = 2πr
= 2 × (22/7) × 35
= 2 × 22 × 5
= 220 m

(b) Area:
A = πr²
= (22/7) × 35 × 35
= (22/7) × 1225
= 22 × 175
= 3,850 m²

Answers:
(a) Circumference = 220 m
(b) Area = 3,850 m²
```

Marking: 1.5 marks for circumference, 1.5 marks for area

SECTION E - APPLICATION BASED QUESTIONS (5 marks each)

Answer 46:

Solution:

Given:
Cost Price (CP) = ₹12,000
Desired Profit = 15%

(a) Selling Price for 15% profit:
Profit = 15% of 12,000
= (15/100) × 12,000 = ₹1,800

Marked Price (MP) = CP + Profit
= 12,000 + 1,800 = ₹13,800

(b) Final selling price after 5% discount:
Discount = 5% of 13,800
= (5/100) × 13,800 = ₹690

Final SP = MP - Discount
= 13,800 - 690 = ₹13,110

(c) Actual profit after discount:
Actual Profit = Final SP - CP
= 13,110 - 12,000 = ₹1,110

(d) Profit percentage after discount:
Profit % = (Actual Profit/CP) × 100
= (1,110/12,000) × 100
= 9.25%

Answers:
(a) MP = ₹13,800
(b) Final SP = ₹13,110

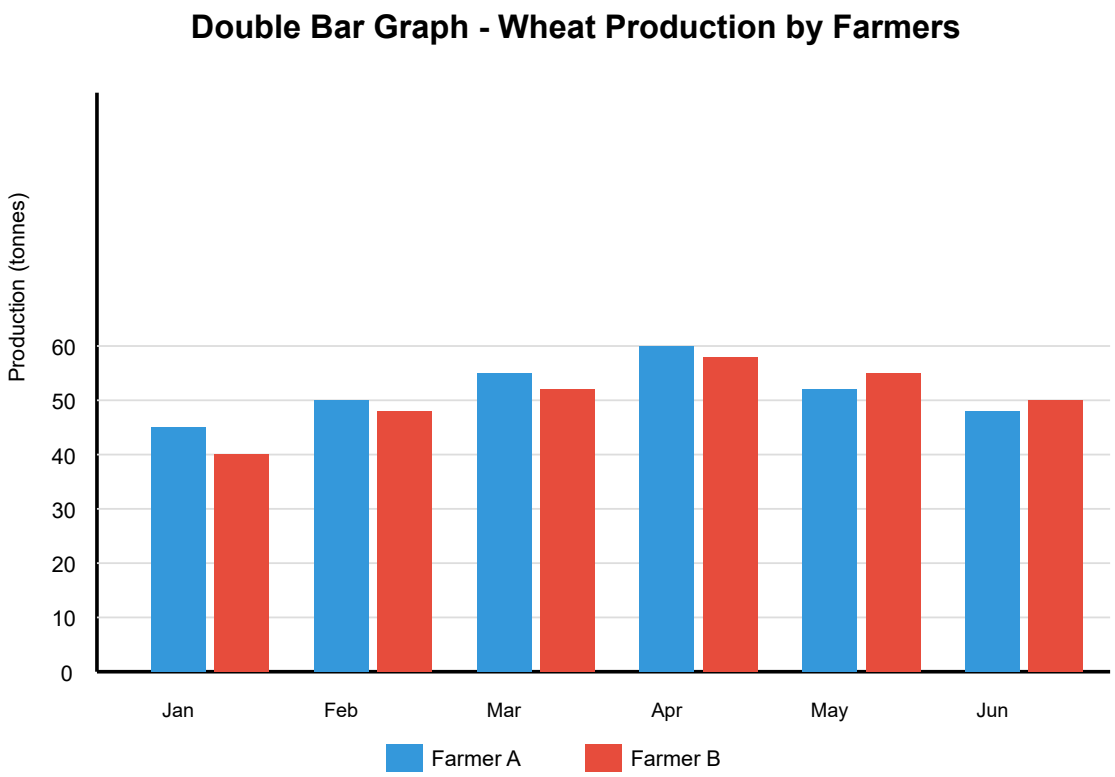
(c) Actual Profit = ₹1,110

(d) Profit % = 9.25%

Marking: 1 mark for (a), 1.5 marks for (b), 1.5 marks for (c), 1 mark for (d)

Answer 47:

Solution:



(b) Months where Farmer A produced more than Farmer B:

January: 45 > 40 ✓

February: 50 > 48 ✓

March: 55 > 52 ✓

April: 60 > 58 ✓

June: 48 < 50 ✗

May: 52 < 55 ✗

Answer: January, February, March, and April

(c) Total production:

```
Farmer A = 45 + 50 + 55 + 60 + 52 + 48 = 310 tonnes
Farmer B = 40 + 48 + 52 + 58 + 55 + 50 = 303 tonnes

(d) Difference:
Farmer A produced more
Difference = 310 - 303 = 7 tonnes

Farmer A produced 7 tonnes more wheat than Farmer B.
```

Marking: 2 marks for graph, 1 mark for (b), 1 mark for (c), 1 mark for (d)

Answer 48:

Solution:

```
Given:
Length of field = 80 m
Width of field = 60 m
Width of path = 5 m

(a) Area of field:
Area = length × width
= 80 × 60
= 4,800 m²

(b) Area of path:
The path runs inside along the perimeter.
Inner length = 80 - 2(5) = 70 m
Inner width = 60 - 2(5) = 50 m

Area of inner rectangle = 70 × 50 = 3,500 m²
Area of path = Total area - Inner area
= 4,800 - 3,500
= 1,300 m²

(c) Area of remaining field (excluding path):
This is the same as inner area = 3,500 m²
```

(d) Cost of growing grass:

Rate = ₹15 per m²

Area = 3,500 m²

Total cost = 3,500 × 15

= ₹52,500

Answers:

(a) Area of field = 4,800 m²

(b) Area of path = 1,300 m²

(c) Remaining area = 3,500 m²

(d) Total cost = ₹52,500

Marking: 1 mark for (a), 1.5 marks for (b), 1 mark for (c), 1.5 marks for (d)

END OF QUESTION PAPER

Total Marks: 80

Best wishes for your examination!