Grade 09
Unit 06

Maths

Course Outline

Summative-1

MAT

(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U060

SOUVENIR INFOTECH

Guide Lines

1.Each set consists of:

50 | Warm-up/Foundation Questions

30 | Regular Questions

20 | Thinking Ability Questions

2.The time allocation and instructions regarding the questions are printed clearly in the beginning of each question types. The answers should be written or tick marked as per the instructions given. It is suggested to use pencil initially, so as to enable you to reuse the practice papers.

3. **According to the new pattern of CBSE these practice papers will be very useful especially for syllabus related Quiz, Debates, Visuals related checking and Orals etc.,**

4.After marking the answers, the scores of students can be checked and for marks obtained guidelines are given along with the question solving instructions. Follow those instructions and if, you are fully satisfied with your performance then check for your expected grades as per the CBSE guidelines as given on the back of each set.

5.Remember that this is only a guideline not the finally worked out result. You can further improve your performance by increase your practice.

6.For your convenience please follow following essential examiner's advices:

a.Answer all the questions
b.Read all the Options carefully
c.Understand and use correct scientific language in your responses.

We from SOUVENIR INFOTECH **wish skillful learning for your bright future.**

Before going for the test, look at least :

1. First of all go through the syllabus of the test according to the **Course Outline** provided at the front page of each MAT.
2. After going through the syllabus once or twice or even more time as per your satisfaction, first of all do the Warm-up questions. If you score A+ grade in those 50 questions go to the next level otherwise go through the chapter again.
3. The box for **Specific Information** is very useful as it adds to your concept building. Try to fill specific information in the proper way so that you will get the maximum benefit of it.
4. **Let's Chat** portion will help you to prepare for oral assessment. Through this you can increase your capacity to interact on a particular topic related to your syllabus.
5. The **Extra Diet** portion is also there to enhance you knowledge through visulization of concept. This portion provides you added knowledge on various related concepts.
6. The information related to time factor is there to enhance your time management skills.
7. From the examiners point of view it is always advised to use Pencil for initial efforts. The use of pen is fruitful only when the final effort comes.

Examiner's Tips:

- Read the question carefully. Make sure you understand exactly what is required.
- If you find that you are unable to do a part of a question, do not give up. The next part may be easier and may provide a clue to what you might have done in the part you found difficult.
- Note the number of marks per question as guide to the depth of response needed.
- Underline or note the key words that tell you what is required.
- Underline or note data as you read the question.
- Structure your answer carefully.
- Show all steps in calculations. Include equations you use and show the substitution of data. remember to work according to units given.
- Make sure that your answers contain suitable significant figures (wherever necessary) and must include units in numericals.
- Draw diagrams and graphs carefully.
- Read data from graphs carefully; note scales and prefixes on axes.
- Keep your eye on the clock but don't panic.
- If you have time at the end, use it. Check that your descriptions and explanations make sense. Consider whether there is anything you could add to an explanation or description. Repeat calculations to ensure that you have not made a mistake.

50

Opening Window

To enlighten your fundamental/basic topic knowledge.

A+. If you score 45 or above marks, move to the next section confidently.

A. If you score between 40 and 45 marks, it is satisfactory. Bit more knowledge will bring excellent result.

B. If you score below 40, kindly go through the topic more seriously.

Section A (50 marks) **Time given – 50 minutes + 5 minutes for revision**

Questions 1 to 50 carry 1 mark each.

For questions 1 to 20 four options are given one of them is the correct answer make your choice and write its name (a, b, c or d) in the answer box provided.

1. Express $\frac{7}{8}$ in the decimal form (by long division method)

T – 1 min
S – Number systems

(a) 0.857 (b) 0.875
(c) 0.785 (d) .758

Ans.

2. Express 8.0025 decimal numbers in the form of $\frac{p}{q}$

T – 1 min
S – Number systems

(a) $\frac{3201}{400}$ (b) $\frac{3201}{600}$
(c) $\frac{3201}{500}$ (d) $\frac{3201}{200}$

Ans.

3. $\frac{6}{2\sqrt{3}}$ is

T – 1 min
S – Irrational

(a) rational (b) irrational
(c) whole number (d) natural number

Ans.

4. Evaluate $5^8 \div 5^3$

T – 1 min
S – Exponents

(a) 3125 (b) 625
(c) 125 (d) 15625

Ans.

6. Find the value of x, if $5^{x-3} \cdot 3^{2x-8} = 225$

(a) 5 (b) 2

(c) 3 (d) 4

T – 1 min
S – Exponents

Ans.

7. If $x = \frac{1}{2-\sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$

(a) $\sqrt{3}$ (b) 3

(c) $3\sqrt{3}$ (d) 1

T – 1 min
S – Rationalisation

Ans.

8. Find the product of $(2x + 3y)(2x - 3y)$.

(a) $x^2 - 9x^2$ (b) $4x^2 - y^2$

(c) $4x^2 - 9y^2$ (d) $x^2 - y^2$

T – 1 min
S – Algebraic identities

Ans.

9. If $a + b + c = 0$, then $a^3 + b^3 + c^3 =$

(a) $3abc$ (b) abc

(c) $\frac{1}{3}abc$ (d) $\frac{3}{2}abc$

T – 1 min
S – Algebraic identities

Ans.

10. Find the zero of the polynomial $f(x) = x - 5$

(a) -5 (b) 0

(c) 5 (d) 1

T – 1 min
S – Polynomial

Ans.

11. Determine the remainder when the polynomial $p(x) = x^4 + 2x^2 + 1$ is divided by $x - 1$.

(a) 4 (b) 3

(c) 5 (d) 2

T – 1 min
S – Polynomial

Ans.

12. Two distinct points in a place determine a _____ line

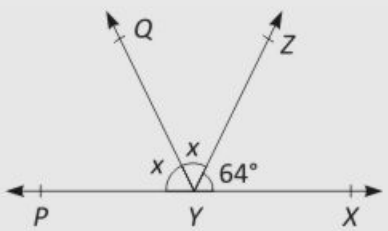
(a) unique (b) parallel

(c) perpendicular (d) same

T – 1 min
S – Lines and angles

Ans.

13. Find x in the given figure.



T – 1 min
S – Lines and angles

(a) 58° (b) 60° (c) 54° (d) 72°

Ans.

14. Sum of the angles of a triangle is

(a) $90°$ (b) $180°$

(c) $80°$ (d) $75°$

T – 1 min
S – Triangle

Ans.

15. In ΔABC, $\angle A = 100°$ and $AB = AC$. Find $\angle B$ and $\angle C$.

(a) $40°, 50°$ (b) $40°, 40°$

(c) $60°, 60°$ (d) $50°, 40°$Triangle

T – 1 min
S – Triangle

Ans.

16. OY' is called ..... direction of y-axis

(a) positive (b) negative

(c) left (d) right

T – 1 min
S – Co-ordinate geometry

Ans.

17. Which of these is not a polynomial in one variable

(a) $8x^2 + x + 1$ (b) $x^2 + y^2 + z^2$

(c) $2x^2 + 3x^4 + 1$ (d) $x^3 + x^2 + x + 1$

T – 1 min
S – Polynomial

Ans.

18. Factors of $x^2 + 5\sqrt{5}\,x + 30$ are

(a) $(x + \sqrt{5})(x + 2\sqrt{5})$ (b) $(x + 3\sqrt{5})(x + 2\sqrt{5})$

(c) $(x + \sqrt{5})(x - 3\sqrt{5})$ (d) $(x - 3\sqrt{5})(x + 2\sqrt{5})$

T – 1 min
S – Polynomial

Ans.

19. A angle which is greater than $0°$ and less than $90°$ is called as

(a) straight angle

(b) acute angle

(c) complementary angle

(d) obtuse angle

T – 1 min
S – Lines and angles

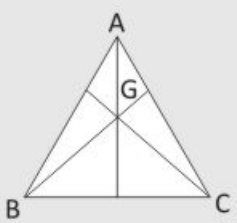
Ans.

20. If the median of a ΔABC intersect at G, area $(\Delta AGB) =$

(a) area (ΔABC) (b) $\frac{1}{2}$ area (ΔABC)

(c) $\frac{1}{3}$ area (ABC) (d) $\frac{1}{4}$ area (ABC)

T – 1 min
S – Triangle



Ans.

Fill in the blanks

21. The decimal expansion of rational numbers are terminating and _____.

T – 1 min
S – Number system

Ans.

22. Every real number is represented by a unique point on the _____ .

T – 1 min
S – Number system

Ans.

23. $x^3 - x^2 + 4x + 7$ is called polynomials in _____ .

T – 1 min
S – Polynomials

Ans.

24. The degree of a non-zero constant polynomial is _____ .

T – 1 min
S – Polynomials

Ans.

25. $(x + a)(x + b) =$ _____.

T – 1 min
S – Polynomials

Ans.

26. Coordinates of the origin are _____ .

T – 1 min
S – Polynomials

Ans.

27. The coordinate axes divide the plane into four parts called _____ .

T – 1 min
S – Co-ordinate geometry

Ans.

28. $ax + by + c = 0$ is called _____ .

T – 1 min
S – Liner equations

Ans.

29. Two distinct lines cannot have more than one point in _____ .

T – 1 min
S – Euclid's geometry

Ans.

30. Triangles on the same base and between the same parallels are equal in _____ .

T – 1 min
S – Triangles

Ans.

True or False

31. An acute angle measures between 0° and 90°.

T – 1 min
S – Lines and angle

Ans.

32. If two line intersect each other, then the vertically opposite angles are not equal

T – 1 min
S – Lines and angle

Ans.

33. Congruent triangles corresponding parts are equal.

T – 1 min
S – Triangles

Ans.

34. Angles opposite to equal sides of an isosceles triangle are equal.

T – 1 min
S – Triangles

Ans.

35. Sum of any two sides of a triangle is smaller than the third side

T – 1 min
S – Triangles

Ans.

36. Area of a quadrilateral whose sides and one diagonal are given, can be calculated by dividing the quadrilateral into two triangles and using the Heron's formula

T – 1 min
S – Heron's formula

Ans.

37. All the rational and irrational numbers make up the collection of real numbers.

T	– 1 min
S	– Number system

Ans.

38. A polynomial of degree three is called cubic polynomial.

T	– 1 min
S	– Cubic polynomial

Ans.

39. $(x-y)^3 = x^3 - y^3 - 3xy(x-y)$

T	– 1 min
S	– Polynomials

Ans.

40. There are infinitely many rational numbers between any two given irrational numbers.

T	– 1 min
S	– Number systems

Ans.

Simple Questions

For questions 41-42. Expand each of the following

41. $(3x+4y)^2$

T	– 2 min
S	– Algebraic identities

Ans.

42. $(\sqrt{2}x-3y)^2$

Ans.

43. Simplify $0.76 \times 0.76 + 2 \times 0.76 \times 0.24 + 0.24 \times 0.24$

T – 1 min
S – Algebraic expression

Ans.

44. AD, BE and CF, the altitudes of ΔABC are equal. Prove that ΔABC is an equilateral triangle.

T – 1 min
S – Triangle

Ans.

For questions 45-46 Rationalise the following

45. $\frac{\sqrt{2}+1}{\sqrt{5}}$

T – 2 min
S – Number systems

Ans.

46. $\frac{1}{2-\sqrt{3}}$

Ans.

47. Define axioms and theorems

T – 1 min
S – Euclid's geometry

Ans.

48. that if the bisector of the vertical angle of a triangle bisects the base of the triangle, then the triangle is isosceles.

T	– 1 min
S	– Triangle

Ans.

For questions 49-50 Factorize the following expressions

49. $x^4 + x^2 + 1$

T	– 2 min
S	– Algebraic identities

Ans.

50. $x^4 + 5x^2 + 9$

Ans.

30

Opening Window

To enlighten your regular knowledge of topic. If you score more than 55 marks here, you have achieved this level brilliantly. Move to the next level of test papers.

Section B (60 marks) **Time given – 45 minutes + 5 minutes for revision**

Questions 51 to 80 carry 2 marks each.

Questions for 54-56 Express each of the following decimals in the form $\frac{p}{q}$.

51. $0.\overline{3}$

T – 3 min
S – Number systems

Ans.

52. $0.3\overline{2}$

Ans.

53. Rationalise the denominator of the following:

$$\frac{1}{\sqrt{3}+\sqrt{2}}$$

Ans.

54. Find the remainder when $f(x) = x^3 + 6x^2 + 2x - 4$ is divided by $x + 1$

T	– 1 min
S	– Polynomials

Ans.

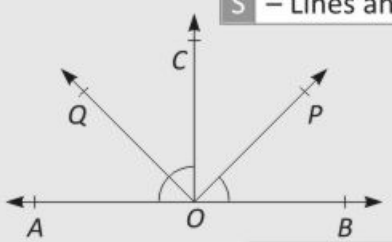
55. Factorize $2x^4 + x^3 - 14x^2 - 19x - 6$ if it is given that $x^2 + 3x + 2$ is its factor. (Use long division method)

T	– 1 min
S	– Polynomials

Ans.

56. In the figure OP bisects $\angle BOC$ and OQ, $\angle AOC$, show that $\angle POQ = 90°$

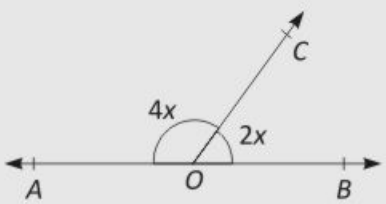
T	– 1 min
S	– Lines and angles



Ans.

57. Determine the value of x, in the following figure.

T	– 1 min
S	– Lines and angles



Ans.

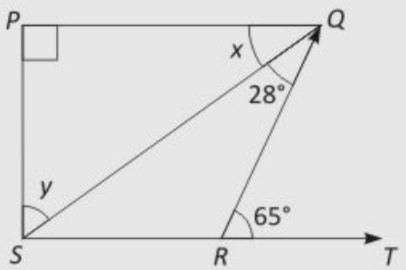
58. In a ΔABC $\angle B = 100°$, $\angle C = 30°$ find $\angle A$

T	– 1 min
S	– Triangles

Ans.

59. In the figure if $PQ \perp PS$, $PQ \| SR$, $\angle SQR = 28°$ and $\angle QRT = 65°$, then find the value of x and y

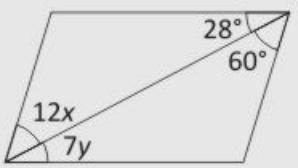
T	– 1 min
S	– Triangles



Ans.

60. In figure $ABCD$ is a parallelogram compute the value of x and y

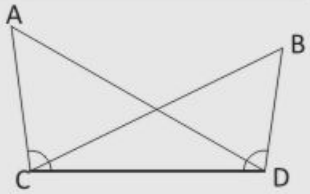
T	– 1 min
S	– Quadrilateral



Ans.

61. In the figure $\angle BCD = \angle ADC$ and $\angle ACB = \angle BDA$ Prove that $AD = BC$ and $\angle A = \angle B$

T	– 1 min
S	– Triangles



Ans.

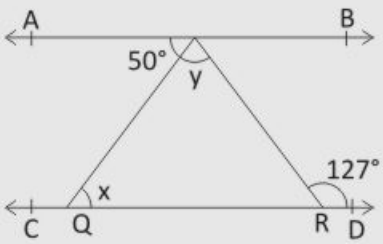
62. In ΔPQR, S is any point on the side QR. Show that $PQ + QR + RP > 2PS$

T	– 1 min
S	– Triangles

Ans.

63. Find x and y

T	– 1 min
S	– Lines and angles



Ans.

64. Evaluate $\dfrac{15}{\sqrt{10} + \sqrt{20} + \sqrt{40} - \sqrt{5} - \sqrt{80}}$, is being given that $\sqrt{5} = 2.236$ and $\sqrt{10} = 3.162$

T	– 2 min
S	– Rationalisation

Ans.

65. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x - 3)$, find the value of a

T – 2 min
S – Polynomials

Ans.

Questions 66-68, Find the product of the following

66. $(2x + 3y)^2$

T – 6 min
S – Polynomials

Ans.

67. $\left(\frac{x}{2} - \frac{y}{3}\right)^2$

Ans.

68. $(x + 5)(x - 3)$

Ans.

69. Factorise $y^2 - 5y + 6$ by using factor theorem.

T – 2 min
S – Factorisation

Ans.

70. Find quotient and Remainder of the $4x^2 + 2x - 3$ divided by $x + 1$.

T	– 2 min
S	– Polynomials

Ans.

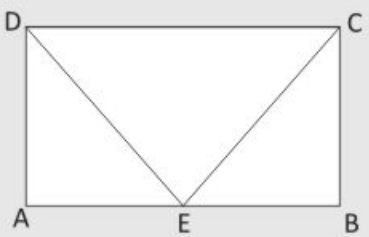
71. rationalize the denominators of the following

$$\frac{1}{\sqrt{3} + \sqrt{2}}$$

T	– 2 min
S	– Rationalize the denominators

Ans.

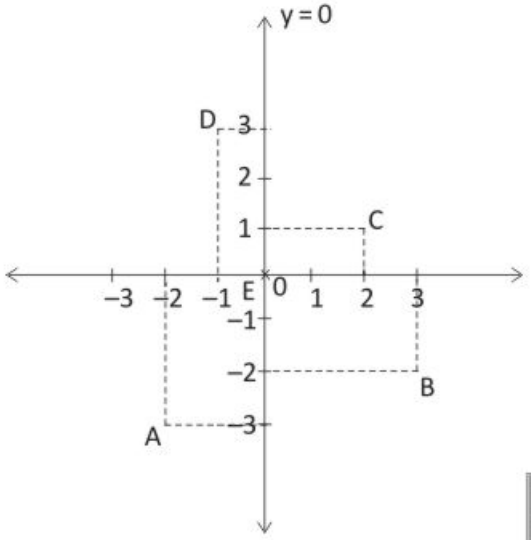
72. Which of the following figures lie on the same base and between the same parallels. In such a case write the common base and the two parallels.



T	– 2 min
S	– Area of parallelograms and triangles

Ans.

Questions 73-76, See the figure and answer the following questions .



T – 4 min
S – Co-ordinates

73. The co-ordinate of *B*

Ans.

74. The abscissa of the point *D*

Ans.

75. The point identified by the co-ordinates $(-2, -3)$

Ans.

76. The ordinate of the point C

Ans.

77. What is the name of horizontal and the vertical lines drawn to determine the position fo any point in the Cartesian plane?

T	– 2 min
S	– Co-ordinates geometry

Ans.

78. Explain the term Cartesian system?

T	– 2 min
S	– Cartesian system

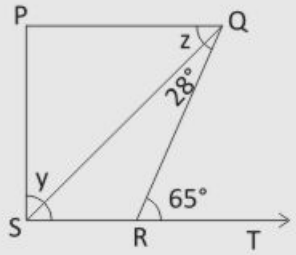
Ans.

79. Show that $(x-2)$ is a factor of the polynomial $f(x)=2x^3-3x^2-17x+30$ and hence factorize $f(x)$

T	– 3 min
S	– Factorization

Ans.

80. In figure of $PS \perp PQ$, $PQ \parallel SR$, $\angle SQR = 28°$ and $\angle QRT = 65°$, then find the values of x and y



T	– 3 min
S	– Triangles

Ans.

20 Thinking Ability Questions

Opening Window

To enlighten your regular knowledge of topic. If you score more than 50 marks here, you have achieved this level brilliantly. Move to the next level of test papers.

Section C (60 marks) **Time given – 45 minutes + 5 minutes for revision**

81. Find one irrational numbers between 2 and 2.5

T – 2 min
S – Rational numbers

Ans.

82. Evaluate $\left(\frac{3}{4}\right)^{-3}$

T – 2 min
S – Exponents

Ans.

83. If $a = 2$ and $b = 3$ find the value of $\left(\frac{1}{a} + \frac{1}{b}\right)^{a}$

T – 2 min
S – Exponents

Ans.

For questions 84-85, Simplify each of the following

84. $(625)^{-1/4}$

T – 4 min
S – Exponents

Ans.

85. $5\sqrt{(32)^{-3}}$

Ans.

86. Simplify $(\sqrt{11}-\sqrt{5})^2$

T – 2 min
S – Algebraic identity

Ans.

87. If $x=3-2\sqrt{2}$, find $\frac{1}{x}$

T – 2 min
S – Rationalization

Ans.

88. If $p=2-a$, prove that $a^3+6ap+p^3-8=0$

T – 2 min
S – Algebraic expression

Ans.

89. Find the value of k if $x+3$ is a factor of $3x^2+kx+6$

T – 2 min
S – Algebraic

Ans.

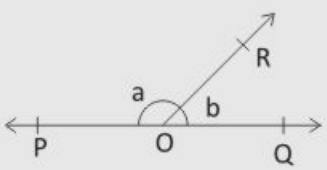
90. If ray OC stands on line AB such that $\angle AOC = \angle COB$ then show that $\angle AOC = 90°$

T – 2 min
S – Lines and angles

Ans.

91. In the figure $\angle POR$ and $\angle QOR$ form a linear pair. If $a-b=80$, find the value of a and b

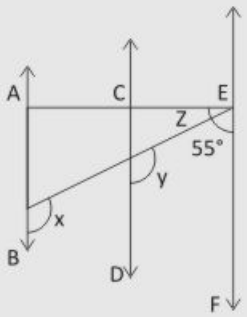
T – 2 min
S – Lines and angles



Ans.

92. In the figure $AB \| CD$ and $CD \| EF$. Also $EA \perp AB$. If $\angle BEF = 55°$, find the values of x, y and z.

T	– 2 min
S	– Lines and angles



Ans.

93. An angle is equal to five times of its compliment. Find its measure.

T	– 2 min
S	– Lines and angles

Ans.

94. Find the remainder when $f(x) = x^3 - 6x^2 + 2x - 4$ is divided by $g(x) = 1 - 3x$

T – 2 min
S – Polynomial

Ans.

95. Find the remainder when the polynomial $4x^3 - 12x^2 + 14x - 3$ is divided by $x - 1$.

T – 2 min
S – Polynomial

Ans.

96. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$ so that the result is exactly divided by $2x^2 + x - 1$?

T	– 3 min
S	– Polynomial

Ans.

97. Use factor theorem to verify that $x + a$ is a factor of $x^n + a^n$ for any odd positive integer.

T	– 3 min
S	– Polynomial

Ans.

98. Find the area of a triangle whose sides are 13 cm, 14 cm and 15 cm.

T	– 3 min
S	– Heron's formula

Ans.

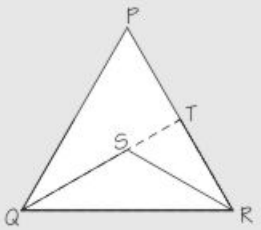
99. If the altitudes from vertices of a triangle to the opposite sides are equal, prove that the triangle is isosceles.

T	– 3 min
S	– Triangles

Ans.

100. In figure, PQR is a triangle and S is any point in its interior. show that $SQ + SR < PQ + PR$.

T	– 3 min
S	– Triangles



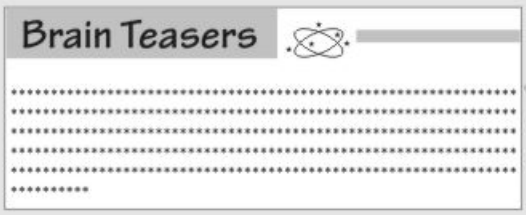
Ans.

Tools at a glance

Opening Window with instructions for your potential analysis and guideline to improve your performance.

Let's Chat, the feature with suggestive topics for discussion so as to improve your capacity to debate on various topics.

Box with time break-up of questions **(T)** and its concept (**S**, i.e., subject)



Brain Teasers i.e., Questions with difference to make the concepts of students crystal clear. These are the questions with higher difficulty levels to check the grip of the students over the concepts.

Extra Diet, the web link, the notation: www._____ to provide additional information regarding the concept for more clarity of thoughts.

CBSE GRADING PATTERN

As the new pattern includes **CCE** (Continuous and Comprehensive Evaluation) which will be run in two terms i.e., from April to September and October to March. Thus the school will conduct four **Formative** and two **Summative** Assessments.

However, the most generalised version of grades is given below:

MARKS PERCENTAGE	GRADE	GRADE POINT	CATEGORY
91 to 100	A1	10	Exceptional
81 to 90	A2	9	Excellent
71 to 80	B1	8	Very Good
61 to 70	B2	7	Good
51 to 60	C1	6	Ordinary
41 to 50	C2	5	Average
33 to 40	D	4	Below Average
21 to 32	E1	3	Improvement Needed
Below 20	E2	Below 2	Unsatisfactory