STUDENTS PERSONAL DATA

Note: Information regarding your achievement in Mathematics, Self - Regulation and Study skills for doctoral research purpose. Your response will be kept confidential and will be used only for doctoral research purpose.

1. Name :
2. Sex : Male ☐ Female ☐
3. Age :
4. Standard : IX ☐ X ☐
5. Medium of instruction : Tamil ☐ English ☐
6. Name of the school and place :
7. District :
8. Type of School : Govt ☐ Aided ☐ Matriculation ☐
9. Religion : Hindu ☐ Muslim ☐ Christian ☐
10. Community : OC ☐ BC ☐ MBC ☐ SC / ST ☐
11. Birth order : 1 ☐ 2 ☐ 3 ☐ Last ☐
12. Occupation and Income :

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13. Parents | Occupation | Monthly income
Father’s   |            |              |
Mother’s   |            |              |
Appendix -II

ACHIEVEMENT TEST IN MATHEMATICS FOR IX STANDARD

Time : 1 hour  Marks : 50
IX-Std

(i) Answer all the questions

(ii) Each question contains four options. Choose the most suitable answer from the four alternatives.

(iii) Each question carries 1 mark

1. A number having non-terminating and recurring decimal expansion is
   a) an integer  b) a rational number
   c) an irrational number  d) a whole number

2. If a number has a non-terminating and non-recurring decimal expansion, then it is
   a) a rational number  b) a natural number
   c) an irrational number  d) an integer

3. Decimal form of \( \frac{3}{4} \) is
   a) -0.75  b) -0.50  c) -0.25  d) -0.125

4. The \( \frac{P}{q} \) form of \( 0.\overline{3} \) is
   a) \( \frac{1}{7} \)  b) \( \frac{2}{7} \)  c) \( \frac{1}{3} \)  d) \( \frac{2}{3} \)
5. Which one of the following is an irrational number?

a) $\pi$  

b) $\sqrt{9}$

c) $\frac{1}{4}$

d) $\frac{1}{5}$

6. The simplest form of $\sqrt{50}$ is

a) $5\sqrt{10}$

b) $5\sqrt{2}$

c) $10\sqrt{5}$

d) $25\sqrt{2}$

7. $\frac{2}{\sqrt{2}}$ is equal to

a) $\sqrt{11}^2$

b) $\sqrt{11}^4$

c) $\sqrt{11}^8$

d) $\sqrt{11}^{16}$

8. The order and radius of the surd $\sqrt[3]{12}$ are respectively

a) 8, 12

b) 12, 8

c) 16, 12

d) 12, 16

9. $(\sqrt{5} - 2)(\sqrt{5} + 2)$ is equal to

a) 1

b) 3

c) 23

d) 21

10. If $A = \{5, \{5, 6\}, 7\}$, which of the following is correct

a) $(5, 6) \in A$  

b) $\{5\} \in A$

c) $\{7\} \in A$

d) $\{6\} \in A$

11. If $X = \{a, \{b, c\}, d\}$ which of the following is a subset of $X$?

a) $\{a, b\}$

b) $\{b, c\}$

c) $\{c, d\}$

d) $\{a, d\}$
12. If \( U = \{1,2,3,4,5,6,7,8,9,10\} \) and \( A = \{2,5,6,9,10\} \) then \( A' \) is
a) \( \{2,5,6,9,10\} \) b) \( \emptyset \) c) \( \{1,3,5,10\} \) d) \( \{1,3,4,7,8\} \)

13. If \( A \) is a proper subset of \( B \) then \( A \cap B = \)
a) \( A \) b) \( B \) c) \( \emptyset \) d) \( (A \cup B) \)

14. The shaded region in the adjoining diagram represents
a) \( A - B \) b) \( A' \) c) \( B' \) d) \( B - A \)

15. If \( A = \{a, b, c\} \) \( B = \{e, f, q\} \) then \( A \cap B = \)
a) \( \emptyset \) b) \( A \) c) \( B \) d) \( A \cup B \)

16. The shaded region in the adjoining diagram represents
a) \( A - B \) b) \( B - A \) c) \( A \Delta B \) d) \( A' \)

17. The co-efficients of \( x^2 \) and \( x \) in \( 2x^3 - 3x^2 - 2x + 3 \) are respectively.
a) 2, 3 b) -3, -2 c) -2, -3 d) 2, -3

18. The degree of the polynomial \( 4x^2 - 7x^3 + 6x + 1 \) is
a) 2 b) 1 c) 3 d) 0

\[ x = \{a, b, c, d\} \text{ எனில், பின்னர்த்தன்னால் என்ன இன இலக்கமானது?} \]

\( \text{a) } \{a, b\} \quad \text{b) } \{b, c\} \quad \text{c) } \{c, d\} \quad \text{d) } \{a, d\} \)

\[ 12. \text{ If } U = \{1,2,3,4,5,6,7,8,9,10\} \text{ and } A = \{2,5,6,9,10\} \text{ then } A' \text{ is} \]

\[ \text{a) } \{2,5,6,9,10\} \quad \text{b) } \emptyset \quad \text{c) } \{1,3,5,10\} \quad \text{d) } \{1,3,4,7,8\} \]

\[ U = \{1,2,3,4,5,6,7,8,9,10\} \text{ ஏனைய } A = \{2,5,6,9,10\} \text{ எனில் } A \text{ என்பது} \]

\( \text{a) } \{2,5,6,9,10\} \quad \text{b) } \emptyset \quad \text{c) } \{1,3,5,10\} \quad \text{d) } \{1,3,4,7,8\} \)

\[ 13. \text{ If } A \text{ is a proper subset of } B \text{ then } A \cap B = \]

\[ \text{a) } A \quad \text{b) } B \quad \text{c) } \emptyset \quad \text{d) } (A \cup B) \]

\[ A \text{ என்பது } B \text{ இன் சுழு இலக்கம் எனில் } A \cap B = \]

\( \text{a) } A \quad \text{b) } B \quad \text{c) } \emptyset \quad \text{d) } (A \cup B) \)

\[ 14. \text{ The shaded region in the adjoining diagram represents} \]

\( \text{a) } A - B \quad \text{b) } A' \quad \text{c) } B' \quad \text{d) } B - A \)

\[ \text{டார்டு நிலை பற்றிய பிரமிதப் பகுதி என்பது} \]

\( \text{a) } A - B \quad \text{b) } A' \quad \text{c) } B' \quad \text{d) } B - A \)

\[ 15. \text{ If } A = \{a, b, c\} \text{ } B = \{e, f, q\} \text{ then } A \cap B = \]

\[ \text{a) } \emptyset \quad \text{b) } A \quad \text{c) } B \quad \text{d) } A \cup B \]

\[ A = \{a, b, c\} \text{ } B = \{e, f, q\} \text{ எனில் } A \cap B = \]

\( \text{a) } \emptyset \quad \text{b) } A \quad \text{c) } B \quad \text{d) } A \cup B \)

\[ 16. \text{ The shaded region in the adjoining diagram represents} \]

\( \text{a) } A - B \quad \text{b) } B - A \quad \text{c) } A \Delta B \quad \text{d) } A' \)

\[ \text{டார்டு நிலை பற்றிய பிரமிதப் பகுதி என்பது} \]

\( \text{a) } A - B \quad \text{b) } B - A \quad \text{c) } A \Delta B \quad \text{d) } A' \)

\[ 17. \text{ The co-efficients of } x^2 \text{ and } x \text{ in } 2x^3 - 3x^2 - 2x + 3 \text{ are respectively.} \]

\[ \text{a) } 2, 3 \quad \text{b) } -3, -2 \quad \text{c) } -2, -3 \quad \text{d) } 2, -3 \]

\[ 2x^3 - 3x^2 - 2x + 3 \text{ எனும் பல்லுமன் செயல்பாடு இலக்கம் } x^2 \text{ பல்லுமன் } x \text{ இன் இலக்கங்கள்} \]

\( \text{a) } 2, 3 \quad \text{b) } -3, -2 \quad \text{c) } -2, -3 \quad \text{d) } 2, -3 \)

\[ 18. \text{ The degree of the polynomial } 4x^2 - 7x^3 + 6x + 1 \text{ is} \]

\[ \text{a) } 2 \quad \text{b) } 1 \quad \text{c) } 3 \quad \text{d) } 0 \]

\[ 4x^2 - 7x^3 + 6x + 1 \text{ எனும் பல்லுமன் செயல்பாடு} \]

\( \text{a) } 2 \quad \text{b) } 1 \quad \text{c) } 3 \quad \text{d) } 0 \)
19. The polynomial $3x-2$ is a
   a) linear polynomial  
   b) quadratic polynomial
   c) cubic polynomial  
   d) constant polynomial

20. The polynomial $4x^2 + 2x - 2$ is a
   a) linear polynomial  
   b) quadratic polynomial
   c) cubic polynomial  
   d) constant polynomial

21. The zero of the polynomial $2x-5$ is
   a) $\frac{5}{2}$  b) $-\frac{5}{2}$  c) $\frac{2}{5}$  d) $-\frac{2}{5}$

22. The roots of the polynomial equation $x^2 + 2x = 0$ are
   a) $x = 0, 2$  b) $x = 1, 2$  c) $x = 1, -2$  d) $x = 0, -2$

23. One of the factors of $x^3 - 3x - 10$ is
   a) $x-2$  b) $x+5$  c) $x-5$  d) $x-3$

24. One of the factors of $x^3 - 2x^2 + 2x - 1$ is
   a) $x-1$  b) $x+1$  c) $x-2$  d) $x+2$

25. The expansion of $(x+2)(x-1)$ is
   a) $x^2 - x + 2$  b) $(x^2 + x + 2)$  c) $x^2 + x - 2$  d) $x^2 - x + 2$
26. The expansion of \((x+1)(x-2)(x+3)\) is
   a) \(x^3 + 2x^2 - 5x - 6\)
   b) \(x^3 - 2x^2 + 5x - 6\)
   c) \(x^3 + 2x^2 + 5x - 6\)
   d) \(x^3 + 2x^2 + 5x + 6\)

27. Factorization of \(x^2 + 2x - 8\) is
   a) \((x+4)(x-2)\)
   b) \((x-4)(x+2)\)
   c) \((x+4)(x+2)\)
   d) \((x-4)(x-2)\)

28. If one of the factor of \(x^2 - 6x - 16\) is \((x+2)\) then other factors is
   a) \((x+5)\)
   b) \((x-5)\)
   c) \((x+8)\)
   d) \((x-8)\)

29. If \(x + y = 10\) and \(x - y = 2\) then value of \(x\) is
   a) 4
   b) -6
   c) -4
   d) 6

30. The value of \(2\sin 30^\circ \cos 30^\circ\) is equal to
   a) \(\tan 30^\circ\)
   b) \(\cos 60^\circ\)
   c) \(\sin 60^\circ\)
   d) \(\cot 60^\circ\)

31. \(\cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ\) is equal to
   a) \(\cos 90^\circ\)
   b) \(\cos ec 90^\circ\)
   c) \(\sin 30^\circ + \cos 30^\circ\)
   d) \(\tan 90^\circ\)
32. The value of \( \sec 29^\circ - \cos ec 61^\circ \) is
   a) 1  
   b) 0  
   c) \( \sec 60^\circ \)  
   d) \( \cos ec 29^\circ \)

33. The value of \( \sin 60^\circ \cos 30^\circ + \cos 60^\circ \sin 30^\circ \) is equal to
   a) \( \sec 90^\circ \)  
   b) \( \tan 90^\circ \)  
   c) \( \cos 60^\circ \)  
   d) \( \sin 90^\circ \)

34. The value of \( \cos^2 30^\circ - \sin^2 30^\circ \) is
   a) \( \cos 60^\circ \)  
   b) \( \sin 60^\circ \)  
   c) 0  
   d) 1

35. The mean of the first 10 natural number is
   a) 25  
   b) 55  
   c) 5.5  
   d) 2.5

36. The Arithmetic mean of integers from -5 to 5 is
   a) 3  
   b) 0  
   c) 25  
   d) 10

37. The mode of the numbers -5,-5,5,-5,5,5,1,2,2,3,3,3,4,4,4,4 is
   a) 2  
   b) 3  
   c) 4  
   d) 5

38. The median of 14,12,10,9,11 is
   a) 11  
   b) 10  
   c) 9.5  
   d) 10.5

39. The median of 2,7,4,8,9,1 is
   a) 4  
   b) 6  
   c) 5.5  
   d) 7

40. The mean of first 5 whole number is
   a) 2  
   b) 2.5  
   c) 3  
   d) 0
41. The Arithmetic mean of all the factors of 24 is
   a) 8.5  b) 5.67  c) 7  d) 7.5

42. If an angle is equal to one third of its supplement, its measure is equal to
   a) 40°  b) 50°  c) 45°  d) 55°

43. The complement of an angle exceeds the angle by 60°, then the angle is equal to
   a) 25°  b) 30°  c) 15°  d) 35°

44. ABCD is a parallelogram, E is the mid point of AB and CE bisects ∠BCD then
   ∠DEC is
   a) 60°  b) 90°  c) 100°  d) 120°

45. The scientific notation of 0.00036 is
   a) 3.6 × 10⁻³   b) 3.6 × 10⁻³   c) 3.6 × 10⁻⁴   d) 3.6 × 10⁴

46. The decimal form of 2.57 × 10³ is
   a) 257  b) 2570  c) 25700  d) 257000

47. The logarithmic form of 5² = 25 is
   a) log₂ 25 = 2  b) log₅ 2 = 25  c) log₂ 5 = 25  d) log₂₅ 5 = 2
5^2 = 25

\( \log_5 25 = 2 \)  \( \log_5 2 = 25 \)  \( \log_5 5 = 2 \) \( \log_5 5 = 2 \)

48. The value of \( \log_\frac{1}{2} 4 \) is

a) -2  b) 0  c) \( \frac{1}{2} \)  d) 2

49. Probability of screw event is

a) 1  b) 0  c) \( \frac{1}{2} \)  d) -1

50. Probability of impossible event is

a) 1  b) 0  c) \( \frac{1}{2} \)  d) 2
### Appendix-II(a)

Answer keys for achievement test in Mathematics for IX standard

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ACHIEVEMENT TEST IN MATHEMATICS FOR X STANDARD

Class : X  
Time : 45 Minutes  
Marks : 50

(i) Answer all the questions
(ii) Each question contains four options. Choose the most suitable answer from the four alternatives.
(iii) Each question carries 1 mark

1. The set $A = \{a, e, i, o, u\}$ is
   a. an infinite set   
   b. a finite set 
   c. an empty set   
   d. none of these
   
2. $n(P(A)) = 32$, then $n(A)$ is
   a. 6   
   b. 4   
   c. 16   
   d. 5

3. The shaded region in the diagram represent
   a. $A-B$  
   b. $B-A$  
   c. $A \Delta B$  
   d. $A$

4. If $n(A) = 20$, $n(B) = 30$ and $n(A \cup B) = 40$, then $n(A \cap B)$ is equal to
   a. 50   
   b. 10   
   c. 40   
   d. 70
n(A) = 20, n(B) = 30

5. If \( f = \{(6,3)(8,9)(5,3)(-1,6)\} \) then the pre-image of 3 are
   a. 5 and -1  
   b. 6 and 8  
   c. 8 and -1  
   d. 6 and 5

6.

\[ f(x) = x^2 + 5 \text{ then } f(-4) = \]
   a. 26  
   b. 21  
   c. 20  
   d. -20

7. In the sequence \( a_n = 5n - 1 \) then the value of \( a_5 \) is
   a. 19  
   b. 8  
   c. 53  
   d. none of these

8. If a, b, c are in G.P then \( \frac{a-b}{b-c} \) is equal to
   a. \( \frac{a}{b} \)  
   b. \( \frac{b}{a} \)  
   c. \( \frac{a}{c} \)  
   d. \( \frac{c}{b} \)
10. In a G.P, \( t_2 = \frac{3}{5} \) \( t_3 = \frac{1}{5} \) then the common ratio is
\[ a. \frac{1}{5} \quad b. \frac{1}{3} \quad c. 1 \quad d. 5 \]

11. If \( 1 + 2 + 3 + \cdots + n = k \) then \( 1^3 + 2^3 + \cdots + n^3 \) is equal to
\[ a. K^2 \quad b. K^3 \quad c. \frac{K(K+1)}{2} \quad d. (K+1)^3 \]
\[ 1 + 2 + 3 + \cdots + n = k \text{ then } 1^3 + 2^3 + \cdots + n^3 \text{ is equal to} \]
\[ a) K^2 \quad b) K^3 \quad c) \frac{K(K+1)}{2} \quad d) (K+1)^3 \]

12. The sum of series
\[ 1 + 3 + 5 + \cdots + 399 \]
\[ a. 200 \quad b. 2000 \quad c. 400 \quad d. 40,000 \]
\[ 1 + 3 + 5 + \cdots + 399 \text{ is} \]
\[ a) 200 \quad b) 2000 \quad c) 400 \quad d) 40,000 \]

13. \( S_a = \)
\[ a. \frac{1}{1-r} \quad b. \frac{a}{1-r} \quad c. \frac{a}{r-1} \quad d. \frac{r}{a-1} \]
\[ S_a = \]
\[ a) \frac{1}{1-r} \quad b) \frac{a}{1-r} \quad c) \frac{a}{r-1} \quad d) \frac{r}{a-1} \]

14. The sum of two zeros of the polynomial \( f(x) = 2x^2 + (P+3)x + 5 \) is zero, then the value of \( P \) is
\[ a. 3 \quad b. 4 \quad c. -3 \quad d. -4 \]
\[ f(x) = 2x^2 + (P + 3)x + 5 \]

15. The quotient when \( x^3 - 5x^2 + 7x - 4 \) is divided by \( x - 1 \) is
   a. \( x^2 + 4x + 3 \)
   b. \( x^2 - 4x + 3 \)
   c. \( x^2 - 4x - 3 \)
   d. \( x^2 + 4x - 3 \)

16. If \( \alpha \) and \( \beta \) are the roots of \( ax^2 + bx + c = 0 \), then one of the quadratic equation whose roots are \( \frac{1}{\alpha} \) and \( \frac{1}{\beta} \) is
   a. \( ax^2 + bx + c = 0 \)
   b. \( bx^2 + ax + c = 0 \)
   c. \( cx^2 + bx + a = 0 \)
   d. \( cx^2 + ax + b = 0 \)

17. The sequence root of \( 121x^4y^8z^6(l-m)^2 \) is
   a. \( 11x^2y^4z^4(l-m) \)
   b. \( 11x^4y^8z^3(l-m) \)
   c. \( 11x^2y^4z^6(l-m) \)
   d. \( 11x^2y^4z^3(l-m) \)

18. If \( ax^2 + bx + c = 0 \) has equal roots, then \( c \) is equal
   a. \( \frac{b^2}{2a} \)
   b. \( \frac{b^2}{4a} \)
   c. \( -\frac{b^2}{2a} \)
   d. \( -\frac{b^2}{4a} \)
19. If A and B are square matrices such that $AB = I$ and $BA = I$ then B is
a. Unit matrix
b. Null matrix
c. Multiplicative inverse matrix of A
d. $-A$

20. A is of order $m \times n$ and B is of order $p \times q$ addition of A and B is possible only if
a. $m = p$

21. Determine the matrix A given by $A = (a_{ij})_{2 \times 2}$ where $a_{ij} = \frac{i}{j}$

22. If $A = \begin{pmatrix} 7 & 2 \\ 1 & 3 \end{pmatrix}$ and $A + B = \begin{pmatrix} -1 & 0 \\ 2 & 4 \end{pmatrix}$ then the matrix B is

23. $\begin{pmatrix} 5 & x & 1 \\ 2 & -1 & 3 \end{pmatrix} = 20$ then the value of $x$ is
a. 7  

b. -7  

c. $\frac{1}{7}$  
d. 0
\[
\begin{pmatrix} 5 & x & 1 \\
2 & & \\
3 & & 
\end{pmatrix}
\begin{pmatrix} 2 \\
-1 \\
\end{pmatrix} = 20 \text{ Therefore } x = 7
\]

24. Which of the following is true for any two square matrices A and B of same order
a. \( (AB)^T = A^T B^T \)  
   b. \( (A^T B^T) = A^T B^T \)  
   c. \( (AB)^T = BA \)  
   d. \( (AB)^T = B^T A^T \)

A matrix B is a square matrix of order n, so \( AB \) is of order \( n \times n \).

25. A order m × n, B order n × p then AB order
a. m × n  
   b. m × p  
   c. n × n  
   d. p × p

A matrix A is of order m × n, so \( AB \) is of order m × p.

26. The x and y intercepts of the line 2x-3y+6 = 0, respectively an
a. 2, 3  
   b. 3, 2  
   c. (-3, 2)  
   d. (3, -2)

2x-3y+6 = 0 \text{ for } x \text{ and } y \text{ intercepts of } \text{ a } \text{ line}

27. If the points (2, 5) (4, 6) and (a, a) are collinear, then the value of a is equal to
a. (-8)  
   b. 4  
   c. -4  
   d. 8

28. The angle of inclination of the straight line \( x = \sqrt{3} y \) is
a. 0°  
   b. 60°  
   c. 30°  
   d. 45°

29. The centroid of the \( \Delta \) with vertices at (-2, -5) (-2, 12) and (10, -1) is
a. (6, 6)  
   b. (4, 4)  
   c. (3, 3)  
   d. (2, 2)
(-2, -5) (-2, 12) (10, -1)

30. If a straight line intersects the sides AB and AC of a \( \triangle ABC \) at D and E respectively and is parallel to BC, then \( \frac{AE}{AC} = \)

a. \( \frac{AD}{DB} \)  
   b. \( \frac{AD}{AB} \)  
   c. \( \frac{DE}{BC} \)  
   d. \( \frac{AD}{EC} \)

31. AB and CD are two chords of a circle which when produced to meet at a point P such that AB = 5, AP = 8 and CD = 2 then PD =

a. 12  
   b. 5  
   c. 6  
   d. 4

32. In the adjoining figure \( \angle ABC = \)

a. 45°  
   b. 30°  
   c. 60°  
   d. 50°
33. In the figure PA and PB are tangents to the circle drawn from an external point P. Also CD is a tangent to the circle at Q. If PA = 8 cm and CQ = 3 cm the PC is equal to

a. 11 cm  

b. 5 cm  

c. 24 cm  

d. 38 cm

34. In the adjoining figure, chords AB and CD intersect at P. If AB = 16 cm, PD = 8 cm, PC = 6 cm and AP > PB, then AP =

a. 8 cm  

b. 4 cm  

c. 12 cm  

d. 6 cm
35. The area of two similar triangular are 16 cm² and 36 cm² respectively. If the attitudes of the first triangle is 3 cm then the corresponding attitude of the other is
   a. 6.5 cm  b. 6 cm  c. 4 cm  d. 4.5 cm
(\text{Area}_1 : \text{Area}_2 = 16 : 36, \text{Attitude}_1 = 3 \text{ cm})
(\text{Attitude}_2 = \text{Attitude}_1 \times \sqrt{\text{Area}_2 / \text{Area}_1} = 3 \times \sqrt{16/36} = 3 \times \frac{2}{3} = 2 \text{ cm}, \text{Attitude}_2 = 2 \text{ cm}, \text{Attitude}_1 = 3 \text{ cm})
(\text{Attitude}_2 = 2 \text{ cm})
(a) 6.5 cm  (b) 6 cm  (c) 4 cm  (d) 4.5 cm

36. \((1 - \sin^2 \theta) \sec \theta = \)
   a. 0  b. 1  c. \tan^2 \theta  d. \cos^2 \theta
(\text{Given that } x = a \sec \theta, y = b \tan \theta, \text{then } \frac{x^2}{a^2} - \frac{y^2}{b^2} = \)
\(a) \ 0 \ \ \ b) \ 1 \ \ \ c) \ \tan^2 \theta \ \ \ d) \ \cos^2 \theta

37. \frac{1 + \tan^2 \theta}{1 + \cot^2 \theta} = \)
   a. \cos^2 \theta  b. \tan^2 \theta  c. \sin^2 \theta  d. \cot^2 \theta
(\text{Given that } x = a \sec \theta, y = b \tan \theta, \text{then } \frac{x^2}{a^2} - \frac{y^2}{b^2} = \)
\(a) \ \cos^2 \theta \ \ b) \ \tan^2 \theta \ \ c) \ \sin^2 \theta \ \ d) \ \cot^2 \theta

38. If \(x = a \sec \theta, y = b \tan \theta\) then the value of \(\frac{x^2}{a^2} - \frac{y^2}{b^2} = \)
   a. 1  b. -1  c. \tan^2 \theta  d. \cos ec^2 \theta
(\text{Given that } x = a \sec \theta, y = b \tan \theta, \text{then } \frac{x^2}{a^2} - \frac{y^2}{b^2} = \)
\(a) \ 1 \ \ b) \ -1 \ \ c) \ \tan^2 \theta \ \ d) \ \cos ec^2 \theta

39. \(\cos A = \frac{24}{25}\) then \(1 + \tan^2 A = \)
   a. \(\frac{25}{24}\)  b. \(\left(\frac{25}{24}\right)^2\)  c. \(\frac{25^2}{24}\)  d. 1
(\text{Given that } x = a \sec \theta, y = b \tan \theta, \text{then } \frac{x^2}{a^2} - \frac{y^2}{b^2} = \)
\(a) \ \frac{25}{24} \ \ b) \ \left(\frac{25}{24}\right)^2 \ \ c) \ \frac{25^2}{24} \ \ d) \ 1\)
40. The curved surface area of a right circular cylinder of radius 1cm and height 1 cm is equal to
   a. \( \pi \text{ cm}^2 \)  b. \( 2\pi \text{ cm}^2 \)  c. \( 3\pi \)  d. \( 2\text{ cm}^2 \)
   1. \( \pi \text{ cm} \)  2. \( 2\pi \text{ cm} \)  3. \( \pi \)  4. \( \text{ cm} \)
   (a) \( \pi \text{ cm}^2 \)  (b) \( 2\pi \text{ cm}^2 \)  (c) \( 3\pi \)  (d) \( 2\text{ cm}^2 \)

41. If the radius of the sphere is 2cm, then the curved surface area of the sphere is
   a. \( 8\pi \text{ cm}^2 \)  b. \( 16\text{ cm}^2 \)  c. \( 12\pi \text{ cm}^2 \)  d. \( 16\pi \text{ cm}^2 \)
   1. \( 8\pi \text{ cm} \)  2. \( 16\text{ cm} \)  3. \( 12\pi \text{ cm} \)  4. \( 16\pi \text{ cm} \)
   (a) \( 8\pi \text{ cm}^2 \)  (b) \( 16\text{ cm}^2 \)  (c) \( 12\pi \text{ cm}^2 \)  (d) \( 16\pi \text{ cm}^2 \)

42. The ratio of volumes of two cylinders having same radii is 6:7. The ratio of their height is
   a. 6:7  b. 36:49  c. 216:343  d. 7:6
   1. 6:7  2. 36:49  3. 216:343  4. 7:6
   (a) 6:7  (b) 36:49  (c) 216:343  (d) 7:6

43. The range of the first 10 prime number 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 is
   a. 28  b. 26  c. 29  d. 27
   1. 28  2. 26  3. 29  4. 27
   (a) 28  (b) 26  (c) 29  (d) 27

44. For any collection of \( n \) item \( (\sum x) - \bar{x} = \)
   a. \( n\bar{x} \)  b. \( (n-2)\bar{x} \)  c. \( (n-1)\bar{x} \)  d. 0
   1. \( n\bar{x} \)  2. \( (n-2)\bar{x} \)  3. \( (n-1)\bar{x} \)  4. 0
   (a) \( n\bar{x} \)  (b) \( (n-2)\bar{x} \)  (c) \( (n-1)\bar{x} \)  (d) 0

45. Standard Deviation of a collect of data is \( 2\sqrt{2} \). If each value is multiplied by 3 then the standard deviation of the new data is
   a. \( \sqrt{12} \)  b. \( 4\sqrt{2} \)  c. \( 6\sqrt{2} \)  d. \( 9\sqrt{2} \)
   1. \( \sqrt{12} \)  2. \( 4\sqrt{2} \)  3. \( 6\sqrt{2} \)  4. \( 9\sqrt{2} \)
   (a) \( \sqrt{12} \)  (b) \( 4\sqrt{2} \)  (c) \( 6\sqrt{2} \)  (d) \( 9\sqrt{2} \)
46. The probability that a leap year will have 53 Fridays or 53 Saturdays is

a. \( \frac{2}{7} \)  

b. \( \frac{1}{7} \)  

c. \( \frac{4}{7} \)  

d. \( \frac{3}{7} \)

47. If A and B are two events such that \( P(A) = 0.25 \) \( P(B) = 0.05 \) and \( P(A \cap B) = 0.14 \) then \( P(A \cup B) \)

a. 0.61  

b. 0.16  

c. 0.14  

d. 0.6

48. Variance of the first 11 natural numbers is

a. \( \sqrt{5} \)  

b. \( \sqrt{10} \)  

c. \( 5\sqrt{2} \)  

d. 10

49. If \( P(A) = 0.25 \), \( P(B) = 0.50 \), \( P(A \cap B) = 0.14 \) the \( P(\text{neither } A \text{ nor } B) = \)

a. 0.39  

b. 0.25  

c. 0.11  

d. 0.24

50. If the variance of 14, 18, 22, 26, 30 is 32 then the variance of 28, 36, 44, 52, 60 is

a. 64  

b. 128  

c. \( 32\sqrt{2} \)  

d. 32

14, 18, 22, 26, 30 and 28, 36, 44, 52, 60 are

a. \( 32\sqrt{2} \)
## Answer keys for achievement test in Mathematics for X standard

<table>
<thead>
<tr>
<th>Question No</th>
<th>Code name</th>
<th>Item No</th>
<th>Code name</th>
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<td>27</td>
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<td>c</td>
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<td>a</td>
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<td>a</td>
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<td>25</td>
<td>b</td>
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### ACADEMIC SELF-REGULATION QUESTIONNAIRE

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<tr>
<th>Sl. No</th>
<th>Items</th>
<th>Very true</th>
<th>Not very true</th>
<th>Not at all true</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 1.</td>
<td>Why do I do my homework?</td>
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<tr>
<td></td>
<td>Because I want the teacher to think I’m a good student.</td>
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<td></td>
<td>Because I’ll get in trouble if I don’t.</td>
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<tr>
<td></td>
<td>Because it’s fun.</td>
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<td></td>
<td>Because I will feel bad about myself if I don’t do it.</td>
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<td></td>
<td>Because I want to understand the subject.</td>
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<tr>
<td></td>
<td>Because that’s what I’m supposed to do.</td>
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<tr>
<td></td>
<td>Because I enjoy doing my homework.</td>
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<tr>
<td>B. 2.</td>
<td>Why do I work on my classwork?</td>
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<td></td>
<td>So that the teacher won’t yell at me.</td>
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<tr>
<td></td>
<td>Because I want the teacher to think I’m a good student.</td>
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</table>

#### Sl. No 1
1. Because I want the teacher to think I’m a good student.

#### Sl. No 2
2. Because I’ll get in trouble if I don’t.

#### Sl. No 3
3. Because it’s fun.

#### Sl. No 4
4. Because I will feel bad about myself if I don’t do it.

#### Sl. No 5
5. Because I want to understand the subject.

#### Sl. No 6
6. Because that’s what I’m supposed to do.

#### Sl. No 7
7. Because I enjoy doing my homework.

#### Sl. No 8
8. Because it’s important to me to do my homework.

#### Sl. No 9
9. So that the teacher won’t yell at me.

#### Sl. No 10
10. Because I want the teacher to think I’m a good student.
<table>
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<tr>
<td>11.</td>
<td>Because I want to learn new things.</td>
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<tr>
<td>12.</td>
<td>Because I’ll be ashamed of myself if it didn’t get done.</td>
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<tr>
<td>13.</td>
<td>Because it’s fun.</td>
<td></td>
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<tr>
<td>14.</td>
<td>Because that’s the rule.</td>
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<tr>
<td>15.</td>
<td>Because I enjoy doing my classwork.</td>
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<td>16.</td>
<td>Because it’s important to me to work on my classwork.</td>
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<td></td>
<td>C. Why do I try to answer hard questions in class?</td>
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<td>17.</td>
<td>Because I want the other students to think I’m smart.</td>
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<td>18.</td>
<td>Because I feel ashamed of myself when I don’t try.</td>
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<td>20.</td>
<td>Because that’s what I’m supposed to do.</td>
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<td>21.</td>
<td>To find out if I’m right or wrong.</td>
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<td>22.</td>
<td>Because it’s fun to answer hard questions.</td>
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<td>23.</td>
<td>Because it’s important to me to try to answer hard questions in class.</td>
<td>AV [ ∨ A] ∈ 1&amp;overstroke;A M x A B \ \mathrm{V}<em>\alpha \ \mathrm{I} [ \ \mathrm{AV}</em>\gamma \ \mathrm{I}_\mathrm{C} \ =\ A [ A B <em>\gamma] \ \mathrm{K}</em>\lambda \ \mathrm{M}</td>
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<td>24.</td>
<td>Because I want the teacher to say nice things about me.</td>
<td>AV [ A] ∈ 1&amp;overstroke;A_\gamma A <em>\mathrm{E}</em>\gamma S &gt; \ \mathrm{V}<em>\gamma \ \mathrm{I}</em>\mathrm{C} \ =\ A [ A B <em>\gamma] \ \mathrm{K}</em>\lambda \ \mathrm{M}</td>
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<td>25.</td>
<td>D. Why do I try to do well in school?</td>
<td>AV [ A] ∈ 1&amp;overstroke;A^\gamma \ \mathrm{L}<em>\gamma \ \mathrm{A} [ A V</em>\gamma \ \mathrm{OAB}<em>\gamma] \ \mathrm{K}</em>\lambda \ \mathrm{M}</td>
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<td>27.</td>
<td>So my teachers will think I’m a good student.</td>
<td>AV [ A] ∈ 1&amp;overstroke;A^\gamma \ \mathrm{B}<em>\gamma \ \mathrm{OAB}</em>\gamma \ \mathrm{I}<em>\mathrm{C} \ \mathrm{A} \ \ \mathrm{x}</em>\mathrm{M} \ \mathrm{E}<em>\gamma \ \mathrm{V}</em>\lambda \ \mathrm{I}<em>\mathrm{D} ,\ \mathrm{A} [ \ \mathrm{AV}</em>\gamma \ \mathrm{I}<em>\mathrm{D} \ \ \mathrm{OAF}</em>\gamma \ \mathrm{K}_\lambda</td>
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<td>28.</td>
<td>Because I will get in trouble if I don’t do well.</td>
<td>AV [ A] ∈ 1&amp;overstroke;A^\gamma \ \mathrm{B}<em>\gamma \ \mathrm{OAB}</em>\gamma \ \mathrm{I}<em>\mathrm{C} \ \mathrm{A} \ [ \ \mathrm{AV}</em>\gamma \ \mathrm{A}<em>\gamma \ \mathrm{B}</em>\gamma \ \mathrm{OAF}<em>\gamma \ \mathrm{Y}</em>\gamma \ \mathrm{K}<em>\lambda \ \mathrm{D} ,\ \ \mathrm{A} [ \ \mathrm{AV}</em>\gamma \ \mathrm{I}<em>\mathrm{D} \ \ \mathrm{OAF}</em>\gamma \ \mathrm{K}_\lambda</td>
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<td>Because I’ll feel really bad about myself if I don’t do well.</td>
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<td>AV [ A] ∈ 1&amp;overstroke;A^\gamma \ \mathrm{B}<em>\gamma \ \mathrm{OAB}</em>\gamma \ \mathrm{I}<em>\mathrm{C} \ \mathrm{A} [ \ \mathrm{AV}</em>\gamma \ \mathrm{OAB}<em>\gamma] \ \mathrm{K}</em>\lambda \ \mathrm{M} \ \mathrm{X}<em>\mathrm{A}</em>\gamma \ \mathrm{B}<em>\gamma \ \mathrm{V}</em>\gamma \ \mathrm{D}</td>
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<td>31.</td>
<td>Because I will feel really proud of myself if I do well.</td>
<td>AV [ A] ∈ 1&amp;overstroke;A_\gamma \ \mathrm{A}<em>\gamma \ \mathrm{A} <em>\gamma \ \mathrm{D}</em>\gamma \ \mathrm{V}</em>\gamma \ \mathrm{I}<em>\mathrm{D} \ \ \mathrm{A}</em>\gamma \ \mathrm{O}<em>\mathrm{C} \ \ \mathrm{B}</em>\gamma \ \mathrm{V}<em>\gamma \ \mathrm{I}</em>\mathrm{D} \ \ \mathrm{A}<em>\gamma \ \mathrm{D}</em>\gamma</td>
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<tr>
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<tr>
<td>2.</td>
<td>I usually spend hours cramming the night before an exam.</td>
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<tr>
<td>3.</td>
<td>If I spend as much time on my social activities as I want to, I don't have enough time left to study, or when I study enough, I don't have time for a social life.</td>
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<tr>
<td>4.</td>
<td>I usually try to study with the radio and TV turned on.</td>
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<tr>
<td>5.</td>
<td>I can't sit and study for long periods of time without becoming tired or distracted.</td>
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<tr>
<td>6.</td>
<td>I go to class, but I usually doodle, daydream, or fall asleep.</td>
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<tr>
<td>7.</td>
<td>My class notes are sometimes difficult to understand later.</td>
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<tr>
<td>8.</td>
<td>I usually seem to get the wrong material into my class notes.</td>
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<td></td>
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<tr>
<td>9.</td>
<td>I don't review my class notes periodically throughout the semester in preparation for tests.</td>
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<td>10.</td>
<td>When I get to the end of a chapter, I can't remember what I've just read.</td>
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<tr>
<td>11.</td>
<td>I don’t know how to pick out what is important in the text.</td>
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<tr>
<td>12.</td>
<td>I can’t keep up with my reading assignments, and then I have to cram the night before a test.</td>
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<tr>
<td>13.</td>
<td>I lose a lot of points on essay tests even when I know the material well.</td>
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<tr>
<td>14.</td>
<td>I study enough for my test, but when I get there my mind goes blank.</td>
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<tr>
<td>15.</td>
<td>I often study in a haphazard, disorganized way under the threat of the next test.</td>
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<tr>
<td>16.</td>
<td>I often find myself getting lost in the details of reading and have trouble identifying the main ideas.</td>
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<tr>
<td>17.</td>
<td>I rarely change my reading speed in response to the difficulty level of the selection, or my familiarity with the content.</td>
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<tr>
<td>18.</td>
<td>I often wish that I could read faster.</td>
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<tr>
<td>19.</td>
<td>When my teachers assign papers I feel so overwhelmed that I can’t get started.</td>
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<td>20.</td>
<td>I usually write my papers the night before they are due.</td>
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<tr>
<td>21.</td>
<td>I can’t seem to organize my thoughts into a paper that makes sense.</td>
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## Appendix VI

Correlation value for the items of academic self-regulation questionnaire

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* Item is accepted
**Appendix-VII**

Correlation value of for the items of study skills Checklist

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* Item is accepted
NAME OF THE SCHOOLS
TIRUNELVELI

GOVERNMENT

RURAL
2. Govt. higher Secondary School – GangaiKondan.

URBAN

AIDED

RURAL
1. Sankar Nagar Co-education Higher Secondary school-Sangarnagar.

URBAN
1. M.D.T Hindu Co-education Higher Secondary School-Tirunelveli

UNAIDED

RURAL
1. Our Own Modern Matriculation School- Pettai
2. Cambridge Matriculation School - Ambasamudram

URBAN
1. Bell Matriculation School – Palayamkottai.
2. Chinmaya Vidyalaya matriculation School-Tirunelveli.
TUTICORIN

GOVERNMENT

RURAL


URBAN


AIDED

RURAL


URBAN

1. St. Marys Boys Higher Secondary School- Thoothukudi

UNAIDED

RURAL


URBAN

Kanyakumari

GOVERNMENT

RURAL
1. Govt. Higher Secondary School –Vallan Kumaravilai
2. Govt. higher Secondary School –Vellamadam.

URBAN

AIDED

RURAL
1. Sankar Ram Rettiar Higher Secondary School - Nangunery
2. Padmavathy Higher Secondary School - Vallioor

URBAN
1. Joseph Convent School- Nagerkoil
2. Evans Matriculation School- Nagerkoil

UNAIDED

RURAL

1. L.M.S Matric Higher Secondary School- Puthalam
2. L.M.P.C Matric Higher Secondary School –Mukilan vilai

URBAN
1. Hebran Matriculation School - Nagerkoil
2. Alphonza. Matriculation School- Nagerkoil
Appendix - VIII

AREA OF THE STUDY

MAP SHOWING TAMILNADU