

## NET Mathematics MCQs

- 1) If a die is rolled twice then what is the probability that the sum of the number of dots shown is 8?  
 A.  $\frac{5}{36}$  (Correct)  
 B.  $\frac{4}{36}$   
 C.  $\frac{1}{12}$   
 D.  $\frac{1}{2}$
- 2) What is the sine inverse of  $\sin(\pi/2)$ ?  
 A. 1  
 B.  $\pi/2$  radians  
 C. 90 degrees  
 D. Both B and C (Correct)
- 3) What is the derivative of the inverse cosecant function?  
 A.  $(-1)/[|x| \cdot \sqrt{x^2-1}]$  (Correct)  
 B.  $(-1)/[|x| \cdot \sqrt{x^2+1}]$   
 C.  $1/[|x| \cdot \sqrt{x^2-1}]$   
 D.  $1/\sqrt{x^2-1}$
- 4) What is the domain of the inverse cosecant function?  
 A.  $[-1, 1]$   
 B.  $\mathbb{R}$   
 C.  $\mathbb{R} - (-1, 1)$  (Correct)  
 D.  $(-1, 1)$
- 5) Evaluate:  $[\sin^{-1}]_{3/4} + [\sin^{-1}]_{\sqrt{7}/4}$   
 A.  $[\cos^{-1}](0)$   
 B.  $[\sin^{-1}](1)$   
 C.  $[\tan^{-1}](\infty)$   
 D. All of these (Correct)
- 6) How many hours are there in 360 degrees?  
 A. 21600  
 B. 360 (Correct)  
 C. 60  
 D. 3.14

- 7) How many terms are there in the expansion of  $(1+x)^n$ ; considering that 'n' is positive?  
 A.  $n+1$  (Correct)  
 B.  $n$   
 C. Infinite  
 D.  $n-1$
- 8) What is the derivative of  $2t^3$  with respect to  $3t^2$ ?  
 A.  $2t^3$   
 B.  $t$  (Correct)  
 C.  $t^2$   
 D.  $1/t$
- 9)  $1, 1/3, 1/5, 1/7 \dots$  is a/an \_\_\_\_\_ sequence.  
 A. Fibonacci  
 B. Harmonic (Correct)  
 C. Geometric  
 D. Arithmetic
- 10) What is the difference between the arithmetic mean and the geometric mean of 5 and 7?  
 A. 0.8  
 B. 0.08 (Correct)  
 C. 0.008  
 D. 0.0008
- 11) What is the real component of the complex number  $(4-i)^2$ ?  
 A. -8  
 B. 17  
 C. 15 (Correct)  
 D. Missing information
- 12) Which one of the following properties of sets is said to be the commutative property?  
 A.  $A \cup B = B \cup A$  (Correct)  
 B.  $A = B$   
 C.  $A \cup (B \cap C) = (A \cup B) \cap C$   
 D.  $A' = U - A$
- 13) If  $x^4 - 3x^2 + 4 = 0$  then its roots are:  
 A. 2, -2,  $i$  and  $-i$  (Correct)  
 B. 1, -1,  $i$  and  $-i$   
 C.  $i$  only  
 D. Impossible to determine

14) What are the cube roots of unity? [www.PakLearningSpot.com](http://www.PakLearningSpot.com)

- A. 1, -1, i and -i
- B. 1, -1 and i
- C. There doesn't exist such entities in mathematics
- D. 1,  $[-1+\sqrt{3}i]/2$  and  $[-1-\sqrt{3}i]/2$  (Correct)

15) If  $4x/(x-1)(x+1)=A/(x-1)+B/(x+1)$  then the values of 'A' and 'B' are:

- A. 2 and 2 (Correct)
- B. 2 and -2
- C. 1 and -1
- D. Impossible to determine

16) What is the nth term of the sequence: 1, 3, 5, 7...?

- A.  $2n-1$  (Correct)
- B.  $2n+3$
- C.  $2n$
- D. It is impossible to find the nth term for such a sequence

17) What are the two numbers whose sum is 20 but their product is minimum?

- A. 10, 10
- B. 15, 5
- C. 0, 20 (Correct)
- D. 1, 19

18) The set of points P(x,y) in which x and y both are less than zero, lie in which quadrant?

- A. I
- B. II
- C. III (Correct)
- D. IV

19) What is the same as  $\sin(-a)$ ?

- A.  $-\sin(a)$
- B.  $\sin(a)$
- C.  $-\tan(a)/\sec(a)$
- D. Both A and C (Correct)

20) What is the domain of the function  $f(x)=1/\sqrt{x^2+3x+2}$ ?

- A.  $(-1,+\infty) \cup (-2, +\infty)$  (Correct)
- B.  $(-1,-2)$
- C. Set of real numbers
- D.  $(-\infty, +\infty)$

21) If  $f(x)=x^3$ , then what is its inverse?

- A.  $x^{1/3}$
- B.  $3^x$

C.  $[x^{(2/3)}]^{0.5}$  [www.PakLearningSpot.com](http://www.PakLearningSpot.com)  
 D. Both A and C (Correct)

22) If in a triangle,  $a=200$ ,  $b=120$  and  $\gamma=150$  degrees, then what is the area of the triangle?

- A. 10932
- B. Impossible to determine
- C. 7050
- D. 6000 (Correct)

23) Use analytical geometry to determine to classify the quadrilateral ABCD with vertices A(-1,0), B(3,3), C(6,-1), and D(2,-4).

- A. Parallelogram
- B. Square (Correct)
- C. Rhombus
- D. Trapezium

24) Tell the relationship between x and y.

x	0	1	2	3	4	5	6	7	8
y	Undefined	0	0.693	1.099	1.386	1.609	1.792	1.946	2.079

- A.  $y=\ln x$  (Correct)
- B.  $y=\log x$
- C.  $y=1/x$
- D.  $y=e^x$

25) The feasible solution which maximizes or minimizes the objective function is called:

- A. Optimal solution (Correct)
- B. Feasible solution
- C. Linear solution
- D. Quintic solution

26) Evaluate:  $(\sin(\theta)-1)^2+(\sin(\theta)+1)^2$

- A.  $2[1+\sin^2(\theta)]$  (Correct)
- B.  $1+\sin^2(\theta)$
- C. 1
- D.  $2+(\sin^2)(\theta)$

27) If one of the lengths of the sides of an equilateral triangle is 10, then what is the area of the triangle?

- A.  $25\sqrt{3}$
- B. 43.30
- C. Both A and B (Correct)
- D. Missing information

28) Iota expressed in the form of coordinates is:



- A. (0,1) (Correct)
- B. (1,0)
- C. (0,0)
- D. It is impossible to express a complex number in the form of coordinates

29) What is the sum of angles in a quadrilateral?

- A. 120
- B. 180
- C. 270
- D. 360 (Correct)

30) What is the power of fourth power of 'x' in the sixth power of (2-x)?

- A. 24 (Correct)
- B. 10
- C. 6/4
- D. 2

31) What is the sum of the first 50 real numbers?

- A. 500
- B. 1275 (Correct)
- C. 1200
- D. 8900

32) Orders of some matrices are given in the following. Which one of them cannot be multiplied?

- A.  $m \times n$ ,  $n \times p$  where m, n and p are all positive integers
- B.  $a \times b$ ,  $b \times c$  where a, b and c are all positive integers
- C.  $1 \times 2$ ,  $2 \times 6$
- D.  $3 \times 5$ ,  $4 \times 1$  (Correct)

33)  $\sin(\pi/3)$  is equal to?

- A. 0.866 (Correct)
- B. 0.500
- C. 0.707
- D. 0.966

34) What is the formula for  $\tan \theta$ ?

- A.  $\sin \theta / \cos \theta$
- B.  $1 / \cot \theta$
- C.  $\tan(180 + \theta)$
- D. All of these (Correct)

35) What is the formula for  $\cos 2\theta$ ?

- A.  $[1 - \tan^2(\theta)] / [1 + \tan^2(\theta)]$
- B.  $1 - 2\sin^2(\theta)$
- C. Both A and B (Correct)

36) Evaluate:  $\cos \theta + \tan \theta \sin \theta$

- A.  $\sec \theta$
- B.  $1/\cos \theta$
- C.  $\sqrt{1 - \sin^2(\theta)}$
- D. All of these (Correct)

37) Solve:  $(22/7) \cdot \sqrt{3}$

- A. 5.44 (Correct)
- B. 5.20
- C. 5.85
- D. 5.69

38) What is the cosine inverse of  $\cos(0.5)$ ?

- A.  $1/6$
- B.  $1/2$  (Correct)
- C.  $1/3$
- D.  $1/4$

39) Probability of any event cannot have the value of:

- A.  $1/5$
- B.  $1/8$
- C.  $1/2$
- D.  $3/2$  (Correct)

40) If  $A = \{1, 2, 3\}$ ,  $B = \{0, 4, 5\}$  and  $U = \{0, 3, 6\}$ , then find  $n(A \cup B)$ .

- A. 64 (Correct)
- B. 8
- C. 16
- D. 32

41) When both nappes of a double-napped cone are intersected by a plane (not passing through the vertex), the cross section produces a/an:

- A. Hyperbola (Correct)
- B. Circle
- C. Ellipse
- D. Parabola

42) Find the value of  $\cos[(\tan^{-1})(-1)]$ .

- A. 0.766
- B. 0.707 (Correct)
- C. 0.500
- D. 0.087

43) Evaluate:  $\tan(\theta/2)$

- A.  $\sqrt{\frac{1-\cos \theta}{1+\cos \theta}}$   
 B.  $1/\cot(\theta/2)$   
 C.  $\tan(180+\theta/2)$   
 D. All of these (Correct)

44) Evaluate:  $[\tan^{-1}][1/\sqrt{3}]$

- A.  $\pi/6$  radians  
 B.  $\pi/3$  radians  
 C.  $13\pi/6$  radians  
 D. Both A and C (Correct)

45) Find the distance AB between the two points: A(3,1) and B(-2,-4).

- A.  $\sqrt{50}$  (Correct)  
 B.  $\sqrt{26}$   
 C.  $\sqrt{34}$   
 D.  $\sqrt{10}$

46) What are three AMs between -18 and 4?

- A. 12.5, 7 and 1.5  
 B. AM can't be found between a negative and a positive number  
 C. -12.5, -7 and -1.5 (Correct)  
 D. 1, 2 and 3

47) Find the sum:  $1+3+5+\dots+(2n+1)$

- A.  $n^2$  (Correct)  
 B.  $\ln e^2$   
 C.  $2^n$   
 D.  $n^e$

48) What is the domain of  $\tan x$ ?

- A.  $R - (2n+1)(\pi/2)$  where 'n' cannot be zero  
 B.  $R - (2n+1)(\pi/2)$  where 'n' can be zero (Correct)  
 C.  $R - n(\pi)$  where 'n' cannot be zero  
 D. R

49) Which one of the following pairs has the same period?

- A. Tangent function and cotangent function (Correct)  
 B. Sine function and tangent function  
 C. Cosine function and cotangent function  
 D. Cosecant function and tangent function

50) 30 degrees, 45 minutes and 47 seconds are equal to \_\_\_\_\_ degrees:

- A. 30.56  
 B. 30.66  
 C. 30.67  
 D. 30.86 (Correct)

51) Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5?

- A.  $\frac{1}{2}$
- B.  $\frac{2}{5}$
- C.  $\frac{8}{15}$
- D.  $\frac{9}{20}$  (Correct)

52) If  $\alpha$  and  $\beta$  are the roots of the equation  $x^2 - x + 1 = 0$ , then find  $2\alpha$  and  $2\beta$ .

- A.  $1 + \sqrt{3}i$ ,  $1 - \sqrt{3}i$  (Correct)
- B. only  $i$
- C. Impossible to determine
- D.  $i$  and  $-i$

53) If  $A = \{a, b, c\}$  then the number of possible subsets is:

- A. 3
- B. 8 (Correct)
- C. 6
- D. None of these

54) How many 6-digit numbers can be formed without repeating any digit from the digits 0, 1, 2, 3, 4 and 5?

- A. 120
- B. 720 (Correct)
- C. 96
- D. 4920

55) If a parabola has an equation of  $y^2 = 4x$ , then find its focus.

- A. (1,0) (Correct)
- B. (0,1)
- C. (4,0)
- D. (0,4)

56) Any line parallel to x-axis has a slope of:

- A. 0 (Correct)
- B. infinity
- C. 1
- D. -1

57) The product of all the three cube roots of unity is:

- A. 1 (Correct)
- B. -1
- C.  $-1 + \sqrt{3}i$
- D. 0



58)  $\frac{2}{3}$  is a/an \_\_\_\_\_ [www.PakLearningSpot.com](http://www.PakLearningSpot.com)

- A. Irrational
- B. Rational
- C. Positive
- D. Both B and C (Correct)

59) How many radians are there in a degree?

- A. 0.07145 (Correct)
- B. 0.06250
- C. 0.06145
- D. 0.07135

60) Which one of the following things a hyperbola has?

- A. One focus and two directrices
- B. Two foci and two directrices (Correct)
- C. Two foci and one directrix
- D. None of these

61) A line segment that touches two points on the outside of the circle but doesn't pass through the center is called:

- A. Chord (Correct)
- B. Diameter
- C. Radius
- D. None of these

62) In a right-angled triangle, if a median drawn from the right angle to the hypotenuse has a length of 6 meters, then what is the length of the hypotenuse?

- A. 12 meters (Correct)
- B. 6 meters
- C. 3 meters
- D. 36 meters

63) If we have a function  $f(x,y)=c$ , then we differentiate it using the method of:

- A. Chain Rule
- B. Implicit differentiation (Correct)
- C. Product Rule
- D. Newton's method

64) The sum of coefficients in the expansion of  $(x+y)^5$  is:

- A. 128
- B. 64
- C. 32 (Correct)
- D. 16

65) If the sum of two consecutive integers is 'x', then what is the product of them?

A.  $(x^2-1)/4$  (Correct) [www.PakLearningSpot.com](http://www.PakLearningSpot.com)

B.  $(x^2-1)/2$

C.  $x^2-1$

D. None of these

66) What fraction is the result of the sum of the series:  $0.2+0.02+0.002\dots$

A.  $1/3$

B.  $1/6$

C.  $2/9$  (Correct)

D.  $1/7$

67) Differentiate ' $\sin 2x$ ' with respect to  $x$ .

A.  $2\cos 2x$

B.  $2\sin 2x$

C.  $2[1-2[\sin^2](x)]$

D. Both A and C (Correct)

68) Men and women are in a ratio of P:Q. What is the percentage of men?

A.  $P/P+Q$  (Correct)

B.  $Q/P+Q$

C.  $100/P+Q$

D.  $50/50$

69) Which of the following is the biggest number?

A. 1

B.  $2*\sqrt{2}$

C.  $3*\sqrt{3}$

D.  $4*\sqrt{4}$  (Correct)

70) What is the geometric mean of 32 and 64?

A.  $32*\sqrt{2}$

B.  $\sqrt{32*64}$

C. Geometric mean of positive numbers isn't possible to determine

D. Both A and B (Correct)

71) Differentiate  $\ln(e)$  with respect to ' $x$ '.

A.  $1/e$

B. 0 (Correct)

C.  $1/x$

D.  $e$

72) Evaluate:  $\cos x * \sin x * \tan x * \cot x * \csc x$

A.  $\cos x$

B.  $1/\sec x$

C. Both A and B (Correct)

D.  $\sin x$

73) Evaluate:  $w^{-23} + w^{-28}$

- A. -1 (Correct)
- B. 1
- C.  $w$
- D.  $w^2$

74) The derivate of  $f(x)$  with respect to 'x' is defined as:

- A. The rate of change in  $f(x)$  with respect to 'x' (Correct)
- B. The increase in the relevance rate of  $f(x)$  with respect to 'x'
- C. The decrease in the relevance rate of  $f(x)$  with respect to 'x'
- D. None of these

75) Which one of the following is the additive inverse for  $2 + \sqrt{3}$ ?

- A.  $\sqrt{3}$
- B.  $-2 + \sqrt{3}$
- C.  $-2 - \sqrt{3}$  (Correct)
- D.  $2 + \sqrt{3}$

76) What are the angles of an equilateral triangle?

- A. 45 degrees, 45 degrees and 90 degrees
- B. 45 degrees, 90 degrees and 45 degrees
- C. 120 degrees, 30 degrees and 30 degrees
- D. 60 degrees, 60 degrees and 60 degrees (Correct)

77) If a square has a side of 2 units, then what is the length of its diagonal?

- A.  $2\sqrt{2}$  (Correct)
- B. 8
- C. 4
- D. 16

78) In an ellipse, what is the name for the line through the focus and perpendicular to the major axis ending at the ellipse?

- A. Focal chord
- B. Minor axis
- C. Latus rectum (Correct)
- D. Vertical asymptote

79) The length of all the sides of a square and an equilateral triangle is 5 units. What is the ratio of the area of the square to the area of the triangle?

- A.  $8/\sqrt{3}$
- B.  $[8\sqrt{3}]/5$
- C.  $4/\sqrt{3}$  (Correct)
- D.  $\sqrt{3}/8$

80) Two figures having the same shape but different sizes are called:

- A. Congruent figures

- B. Similar figures (Correct)  
 C. Equal figures  
 D. All of these

81) Evaluate:  $\cos(-\theta) \cdot \cos(-\theta) \cdot [-\cos(\theta)] \cdot \cos(\theta) \cdot [-\cos(-\theta)]$   
 A.  $[\cos^5](\theta)$  (Correct)  
 B.  $[-\cos^5](\theta)$   
 C.  $[\cos^3](\theta)$   
 D.  $\cos(\theta)$

82) Evaluate:  $[\sin^{-1}]^{3/5}$   
 A.  $[\cos^{-1}]^{4/5}$   
 B.  $[\sec^{-1}]^{5/4}$   
 C.  $[\csc^{-1}]^{5/3}$   
 D. All of these (Correct)

83) What is the period of  $\sin 3x$ ?  
 A.  $(2\pi)/3$  (Correct)  
 B.  $2\pi$   
 C.  $3\pi$   
 D.  $(3\pi)/2$

84) What is the formula of  $\cos 3\alpha$ ?  
 A.  $\cos 2\alpha \cdot \cos \alpha$   
 B.  $4[\cos^3](\alpha) - 3\cos \alpha$  (Correct)  
 C.  $(1 + \cos \alpha)/\sin \alpha$   
 D. Both A and C

85) Differentiate  $3^{2x}$  with respect to 'x'.  
 A.  $2 \cdot \ln 2 \cdot (3^{2x})$  (Correct)  
 B.  $\ln 2 \cdot (3^{2x})$   
 C.  $3^{2x}$   
 D.  $2x/3$

86) Find the integral with respect to x:  $e^x/(e^x+1)$   
 A.  $\ln |e^x+1| + c$  (Correct)  
 B.  $\ln |e^x| + c$   
 C. Impossible to determine  
 D.  $e^x + c$

87) If two coordinates of a rectangle are present in the first quadrant, then which one of the following coordinates is NOT to be of that rectangle?  
 A. (2, 8)  
 B. (2, -8)  
 C. (8, -2)  
 D. (-2, -8) (Correct)



88) Calculate the exact value of the decimal 0.4545...

- A.  $\frac{5}{11}$  (Correct)
- B.  $\frac{50}{11}$
- C.  $\frac{500}{11}$
- D.  $\frac{5000}{11}$

89) What is the cosine inverse of  $\cos(-\frac{1}{2})$ ?

- A.  $-\frac{1}{2}$  (Correct)
- B.  $\frac{1}{2}$
- C.  $\frac{1}{4}$
- D.  $(2\pi)/3$  radians

90) An equation of a parabola is  $(x-2)^2=4(y+2)$ , then its vertex is:

- A. (2, -2) (Correct)
- B. (-2, 2)
- C. (0, 0)
- D. Missing information

91) If 'x' is real, then which one of the following is an odd function?

- A.  $-\sin(x)$  (Correct)
- B.  $-\cos(x)$
- C.  $|x|$
- D.  $(e^x-1)/(e^x+1)$

92) If  $\cos \theta = 1$ , then what is the possible value of  $\theta$ ?

- A. 0 degrees
- B. 360 degrees
- C. 720 degrees
- D. All of these are possible (Correct)

93) If an equation of hyperbola is:  $\frac{x^2}{4}-\frac{y^2}{9}=1$ , then find its eccentricity.

- A.  $\frac{\sqrt{13}}{4}$  (Correct)
- B.  $\frac{9}{4}$
- C.  $\frac{\sqrt{5}}{4}$
- D.  $\sqrt{9} \cdot \sqrt{5}$

94) Every homogenous second degree equation  $ax^2+2hxy+by^2$  represents a pair of lines through the origin. When are these lines coincident?

- A.  $(a \cdot b) < h^2$
- B.  $h^2 = 0$
- C.  $h^2 < (a \cdot b)$
- D.  $h^2 = a \cdot b$  (Correct)

95) Which one of the following is the real part of the complex number:  $6(2-3i)$ ?

- A. 2
- B. 12 (Correct)

- C. -3  
D. 6

96) Simplify:  $(1+\tan x)/(1-\tan x)$

- A.  $\tan(45+x)$  (Correct)  
B. Can't be further simplified  
C.  $\tan(45-x)$   
D.  $\tan(x+1)$

97) If in a triangle,  $\alpha=49$  degrees,  $b=5$  inches and  $c=7$  inches, then what is the length of 'a'?

- A. 5.29 (Correct)  
B. 7.31  
C. 12.07  
D. 9.65

98) The equation which doesn't change by replacing 'x' with '1/x' is called:

- A. Linear  
B. Quadratic  
C. Proportional  
D. None of these (Correct)

99) Differentiate  $\tan[\sqrt{x}]$  with respect to 'x'.

- A.  $[\sec^2][x]/[2\sqrt{x}]$   
B.  $[\sec^2][\sqrt{x}]/[2\sqrt{x}]$   
C.  $[\sec^2][\sqrt{x}]/[2\sqrt{x}]$  (Correct)  
D. None of these

100) Which one of the following is the same as  $\sin(75)$ ?

- A.  $[\sqrt{3}+1]/\sqrt{8}$  (Correct)  
B. It is impossible to determine  
C.  $[\sqrt{3}-1]/\sqrt{8}$   
D.  $[\sqrt{3}+1]/8$