

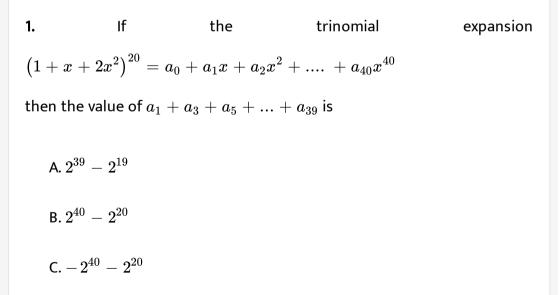


# MATHS

# **BOOKS - NTA MOCK TESTS**

# NTA TPC JEE MAIN TEST 107

### Mathematics



 $\mathsf{D.} - 2^{19} - 2^{39}$ 

# Answer: A



2. Let 
$$A(a\cos\theta, b\sin\theta)$$
 is a variable point,  
 $S \equiv (ap, 0)$  and  $S' \equiv (a - p, 0)$  are two fixex oints where  
 $p = \sqrt{rac{a^2 - b^2}{a^2}}$ . If the locus of incentre of triangle ASS' is a conic then the

eccentricity of the conic in terms of p is

A. 
$$\sqrt{\frac{2p}{+p}}$$
  
B.  $\sqrt{\frac{p}{1+p}}$   
C.  $\sqrt{\frac{1-p}{1+p}}$   
D.  $\frac{p}{2(1+p)}$ 

#### Answer: A

3. The value of the determinant

$$\Delta = egin{bmatrix} \log x & \log y & \log z \ \log 2x & \log 2y & \log 2z \ \log 3x & \log 3y & \log 3z \end{bmatrix}$$
 is

A. 0

B. log(xyz)

C. log(6xyz)

D. 6 log( xyz)

Answer: A

View Text Solution

4. Let A and B be two sets. Theen

A.  $A\cup B\subseteq A\cap B$ 

 $\mathsf{B}.\,A\cap B\subseteq A\cup B$ 

 $\mathsf{C}.\,A\cap B=A\cup B$ 

D. None of these

#### Answer: B



5. If the circle  $x^2 + y^2 = a^2$  intersects the hyperbola  $xy = c^2$  in four points  $(x_i, y_i)$  for =1,2,3 and 4 then  $y_1 + y_2 + y_3 + y_4$  equals

A. 0

B.c

C. a

D.  $c^4$ 

Answer: A

**View Text Solution** 

**6.** From first 100 natural numbers, 3 numbers are selected. If these three numbers are in A. P., then find the probability that these numbers are

even

A. 
$$\frac{1}{66}$$
  
B.  $\frac{29}{66}$   
C.  $\frac{29}{49}$   
D.  $\frac{12}{49}$ 

#### Answer: D

View Text Solution

7. The ratio of the distance from (-1,1,3) and (3,2,1) to the plane 2a + 5y-7z+9 = 0 is
A. 3:2
B. 2:3
C. 1:3
D. 1:2

#### Answer: D



**8.** Tangents are drawn from the origin to the curve y = sin a, then their point of contact lie of the curve

A. 
$$x^2 + y^2 = 1$$
  
B.  $x^2 - y^2 = 1$   
C.  $\frac{1}{x^2} - \frac{1}{y^2} = -1$   
D.  $\frac{1}{x^2} - \frac{1}{y^2} = 1$ 

#### Answer: C



**9.**  $z_1, z_2, z_3$  and  $z_4$  are the affixes of four points in the argand plane and

z affix of a point such that  $|z-z_1|=|z-z_2|=|z-z_3|$  then

 $|z-z_4|$ ,  $z_1, z_2, z_3 \, ext{ and } \, z_4$  are

A. concyclic

B. tices of parallelogram

C. vertices of rhombus

D. in a straight line

#### Answer: A

View Text Solution

10. The value of 
$$\lim_{x o \infty} \left[ rac{1^{rac{1}{x}}+2^{rac{1}{x}}+3^{rac{1}{x}}...+n^{rac{1}{x}}}{n} 
ight]^{nx}$$
 is

A. n!

B. n

C.(n-1)!

D. 0

### Answer: A



11. The valuye of 
$$\int_0^\pi rac{dx}{1-2a\cos x+lpha^2}$$
 is

A. 
$$rac{\pi}{1-lpha^2}$$
 if  $lpha>1$   
B.  $rac{\pi}{lpha^2-1}$  if  $lpha>1$   
C.  $rac{\pi}{lpha^2-1}$  if  $lpha<1$ 

D. 
$$rac{\pi}{lpha^2-1}$$
 if  $lpha < 1$ 

#### Answer: B

View Text Solution

12. If two diameters of a circle of area 154 sq. units are 2ac-3y= 5 & 3a-4y=

# 7. Then the equation of circle is

A. 
$$x^2 + y^2 + 2x^2y = 62$$
  
B.  $x^2 + y^2 + 2x^2y = 47$   
C.  $x^2 + y^2 - 2x + 2y = 47$   
D.  $x^2 + y^2x + 2y = 62$ 

#### Answer: C

View Text Solution

13. Assertion: Area bounded by y = lnx and  $y = \left(\ln x\right)^2$  is  $\int_1^e$  (ln  $x - (\ln x)^2$ ) dx

Reason: Area between y= f(z) and y g() is given as

$$\int_{lpha}^{eta} |f(x)-g(x)| dx$$
, where  $lpha,eta$  are solution of f(x)=g(x)

A. If both [A] and [R] are true, and [R] is the correct explanation of [A]

B. If both [A] and [R] are true but [R] is not the correct explanation of

[A].

C. If [A) is true but [R] is false.

D. if [A] is false but [R] is true.

# Answer: A



14. $\sin x \tan x \cdot \tan 4x = \cos x \mathrm{in} x \in (0,\pi)$ is/are
A. 7
B. 6
C. 5
D. 4

# Answer: C

**15.** If y= f(a) passing through the point P (1, 2) and satisfies the differential equation y(1+ry)da - zdy = 0, then which of the following holds true.

A. 
$$f(x) = rac{2x}{2-x^2}$$
  
B.  $f(x) = rac{x+1}{x^2+1}$   
C.  $f(x) = rac{x-1}{(4-x)^2}$   
D.  $f(x) = rac{4x}{(1-2x)^2}$ 

#### Answer: A

View Text Solution

**16.** Let P(x) be a polynomial of degree 5 with leading coefficient unity. If P(1) = 2, P(2) = 3 P(3) = 4, P(4) = 5 and P(5) = 6 then P(6) is equal to

A. 7

B. 127

C. 126

D. 727

Answer: B



17. Let P(n) denote the statement that  $n^2+n$  is odd. It is seen that  $P(n) \Rightarrow P(n+1)$  then P(n) is true for all

A. n>1

 $\mathsf{B.}\,n\geq 3$ 

 $\mathsf{C}.\,n>2$ 

D. None of these

Answer: D

18. Let f(r) be a polynomial of degree 3 such that

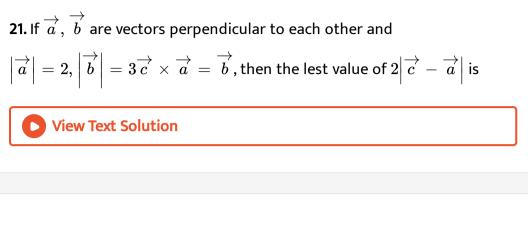
s(3) =21, f(3) = 30, f (3) = 22 and f''' (3) = 6. Find the value of f'(2)



**19.** A student has to answer a question paper that has 8 questions, each question having 2 alternatives. Given that the student has not left answer sheet blank, in how many ways the student can make selections for answering the question paper?

View Text Solution

20. If  $a_1, a_2, \dots, a_{10}$  are positive numbers in an arithmetic progression such  $\frac{1}{a_1a_2} + \frac{1}{a_2a_3} + \dots + \frac{1}{a_9a_{10}} = \frac{9}{64} \text{ and } \frac{1}{a_1a_{10}} + \frac{1}{a_2a_9} + \dots + \frac{1}{a_{10}a_1} =$ then sum of digits of  $\left(4\left(\frac{a_1}{a_{10}} + \frac{a_{10}}{a_1}\right)\right)$  is



**22.** Value of the expression  $16 \sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 100^\circ$  is

View Text Solution

**23.** If 
$$\cos^{-1} = xa$$
 and  $\sin^{-1}\left(2x\sqrt{1-x^2}\right) + \sec^{-1}\left(\frac{1}{2x^2-1}\right) = \frac{2\pi}{3}$   
 $0 < x < \frac{1}{\sqrt{2}}$  then find  $\tan^{-1}(2x)$  in degrees)

View Text Solution

24. For the data of first 10 even natural number, evaluate variance.

