



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 80

Mathematics

1. If
$$f:R
ightarrow R, f(x)=rac{lpha x^2+6x-8}{lpha+6x-8x^2}$$
 is onto then

 $lpha\in$

A. (2, 14)

B. [2, 14)

 $\mathsf{C}.(2,14]$

D. [2, 14]`

Answer: A



2. The compound statement $(p \Leftrightarrow q) \lor (p \Leftrightarrow \neg q)$ is

logically equivalent to

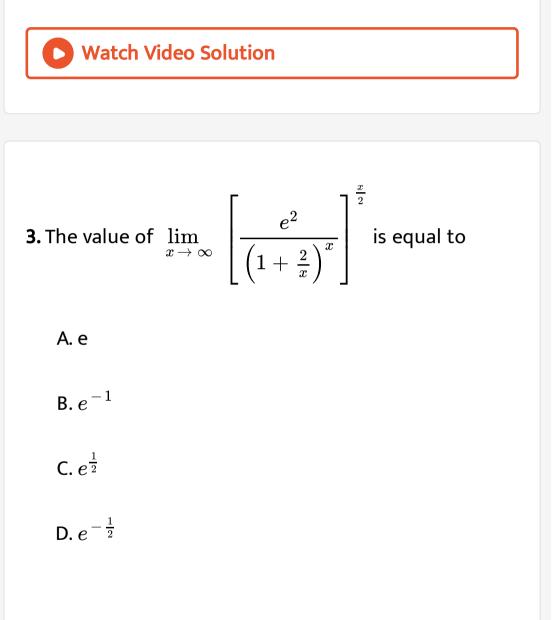
A. $p \Leftrightarrow q$

 $\mathsf{B}.\, p \lor q$

C. tautology

D. contradiction

Answer: C



Answer: A

4. The mean of n items is \bar{x} . If the first item is increased by n, second by n-1 and so on and last by 1, then the new mean is

A.
$$ar{x} + rac{n(n+1)(2n+1)}{6}$$

B. $ar{x} + rac{(n+1)(2n+1)}{6}$
C. $ar{x} + rac{n+1}{2}$
D. $ar{x} + rac{(n+1)}{4}$

Answer: C

5. If $[\sin^{-1}x]^2 - 2[\sin^{-1}x] + 1 \le 0$ (where, [.] represents the greatest integral part of x), then

A.
$$x\in [\sin 1,\sin 2]\cup [\,-1,0]$$

B. $x\in [-\sin 1,0]\cup [\sin 1,1]$

C. $x\in [\sin 1,1]\cup [\,-\sin 1,0]$

D. $x \in [-\sin 1, \sin 2]$

Answer: C



6. If the number of integral of solutions of x+y+z+w < 25 are $.^{23} \, C_\lambda$, such that

 $x>~-2, y>1, z\geq 0, w>3$, then the value of λ is

A. 3

B. 5

C. 17

D. 19

Answer: D

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7. From a point P(3, 3) on the circle $x^2 + y^2 = 18$ two chords PQ and PR each of he length 2 units are drawn on this circle. Then, the value of the length PM is equal to (where, M is the midpoint of the line segment joining Q and R)

A.
$$\frac{1}{3\sqrt{2}}$$
 units
B. $\frac{1}{2}$ units
C. $\frac{\sqrt{2}}{3}$ units
D. $\frac{4}{9}$ units

Answer: C



8. The number of solutions of the equation $\left(3+\cos x
ight)^2=4-2\sin^8 x$ in $\left[0,9\pi
ight)$ is equal to

A. 4

B. 5

C. 6

D. 7

Answer: A



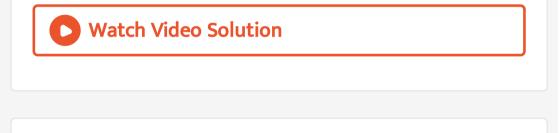
9. If A and B are two events defined on a sample space

with the probabilities
$$P(A)=0.5, P(B)=0.69 ext{ and } P\left(rac{A}{B}
ight)=0.5, ext{ thent}$$
 the value of $P\left(rac{A}{A^c\cup B^c}
ight)$ is equal to

A.
$$\frac{2}{5}$$

B. $\frac{3}{13}$
C. $\frac{31}{131}$
D. $\frac{100}{131}$

Answer: C



2x + ay + 6z = 8, x + 2y + bz = 5 and x + y + 3z = 4

be three equations. If these 3 equations are consistent,

then

A.
$$b=3, a
eq 2$$

B.
$$a=2, b
eq 3$$

C.
$$a
eq 2, b
eq 3$$

D.
$$a
eq 2, b = 4$$

Answer: B



11. Let the equation of a line is
$$\frac{x-2}{1} = \frac{y-3}{2} = \frac{z-4}{3}$$
. An insect starts flying from $P(1, 3, 2)$ in a straight line meeting the given line at a point R(a, b, c) and then goes to the point Q

(6, 7, 5) in a straight line such that PR is perpendicular to RQ. Then the least value of 7(a+b+c) is equal to

A. 105

B.45

C. 10

D. 7

Answer: B



12. Let
$$A=egin{bmatrix} a&b\\c&a \end{bmatrix}orall a,b,c,\ \in \{0,1,2\}.$$
 If A is a

singular matrix, then the number of possible matrices

A are

A. 18

B. 27

C. 7

D. 3

Answer: C

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13.
$$\int \left(rac{dx}{(x+100)\sqrt{x+99}}
ight) = f(x) + c$$

then find f(-99)

14. The number of tangents that can be drawn to $y = e^x$ from $(\pi, 0)$ is

A. 0

B. 1

C. 4

D. 5

Answer: B

15. The area bounded by $y = \left(x^2 - x
ight)^2$ with the x axis, between its two relative minima, is A sq, units, the value of 15A is equal to

A. 1

B. 2

C.
$$\frac{1}{2}$$

D. $\frac{1}{4}$

Answer: C

16. The curve passing through $P(\pi^2, \pi)$ is such that for a tangent drawn to it at a point Q, the ratio of the y - intercept and the ordinate of Q is 1:2. Then, the equation of the curve is

A.
$$y=\pi x^2$$

B. $y=\pi \sqrt{x}$
C. $y=\sqrt{x}$
D. $y=\pi^2 x$

Answer: C

17. The sum of all the values of p for which the lines

$$x+y-1=0, px+4y+2=0$$
 and

4x + py + 7 = 0 are concurrent is euqal to

A. 0

B.-9

C. - 13

D. 3

Answer: C



18. If 11 arithmetic means are inserted between 20 and

10, the number of integral arithmetic means are

A. 1

B. 6

C. 7

D. 8

Answer: A



19. If $x^2 + y^2 = a^2$ and $\frac{x^2}{16} + \frac{y^2}{9} = 1$ intersect at 4 points P, Q, R and S which form a square, then the area (in sq. units) of the square is

A.
$$\frac{144}{25}$$

B. $\frac{25}{4}$
C. $\frac{15}{2}$
D. $\frac{576}{25}$

Answer: D



20. the minimum value of |8Z - 8| + |2Z - 4| exists,

when Z is equal to (where, Z is a complex number)

A. 2

B. 1.5

C. 0

D. 1

Answer: D



21. The remainder obtained when 27^{50} is divided by 12

is

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22. Let
$$f(x) = \begin{cases} rac{1-\cos x}{\left(2\pi-x
ight)^2} \cdot rac{ an tan^2 x}{\ln\left(1+4\pi^2-4\pi x+x^2
ight)} & : \ x
eq 2\pi \\ \lambda & : \ x = 2\pi \end{cases}$$
is

continuous at $x=2\pi$, then the value of λ is equal to

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23. Let
$$\overrightarrow{V}(heta) = (\cos heta + \sec heta), \widehat{a} + (\cos heta - \sec heta)$$

where \widehat{a} and \hat{b} are unit vectors and the angle between

 \widehat{a} and \overrightarrow{g} is 60° , then the minimum value of $\left|\overrightarrow{V}
ight|^4$ is

equal to

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24. If
$$\lim_{n \to \infty} \Sigma_{r=1}^{2n} \frac{3r^2}{n^3} e^{\frac{r^3}{n^3}} = e^a - e^b$$
, then $a + b$ is equal to
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25. Let PQ be the focal chord of the parabola $y^2 = 4x$.

If the centre of the circle having PQ as its diameter lies on the line $y=rac{4}{\sqrt{5}}$, then the radius (in units) is equal

