

# NDA 2 2024

LIVE

# MATHS REVISION

CLASS 10

NAVJYOTI SIR

SSBCrack  
EXAMS



## 20 August 2024 Live Classes Schedule

8:00AM - 20 AUGUST 2024 DAILY CURRENT AFFAIRS RUBY MA'AM

9:00AM - 20 AUGUST 2024 DAILY DEFENCE UPDATES DIVYANSHU SIR

### SSB INTERVIEW LIVE CLASSES

9:00AM - COMPLETE SCREENING TEST ANURADHA MA'AM

### NDA 2 2024 LIVE CLASSES

11:00AM - GK - ECONOMICS REVISION - CLASS 1 RUBY MA'AM

1:00PM - MATHS REVISION - CLASS 10 NAVJYOTI SIR

2:00PM - CHEMISTRY REVISION - CLASS 3 SHIVANGI MA'AM

5:30PM - ENGLISH - REVISION - CLASS 6 ANURADHA MA'AM

### CDS 2 2024 LIVE CLASSES

11:00AM - GK - ECONOMICS REVISION - CLASS 1 RUBY MA'AM

2:00PM - CHEMISTRY REVISION - CLASS 3 SHIVANGI MA'AM

3:00PM - MATHS REVISION - CLASS 10 NAVJYOTI SIR

5:30PM - ENGLISH - REVISION - CLASS 6 ANURADHA MA'AM



# REVISION TOPICS :

- **Limits**
- **Continuity**

Q) If  $\lim_{x \rightarrow 1} \frac{x^2 - ax + b}{x - 1} = 5$ , then  $a + b$  is equal to

- (a) - 4      (b) 1      (c) - 7      (d) 5

L-Hospital rule,

$$\lim_{x \rightarrow 1} \frac{2x-a}{1} = 5$$

$$2 \times 1 - a = 5$$

$$a = 2 - 5 = -3$$

$$\left\{ \begin{array}{l} x^2 - ax + b = 0 \\ x^2 + 3x + b = 0 \\ x = 1 \\ 1^2 + 3 \times 1 + b = 0 \\ b = -4 \end{array} \right.$$

$$a + b = -7$$

As denominator is becoming zero, so numerator also becomes 0, on putting  $x = 1$ .

$$\begin{array}{c}
 \text{(OR)} \quad \lim_{x \rightarrow 1} \frac{x^2 - ax + b}{x-1} = 5 \quad \left| \begin{array}{l} x^2 - (1+b)x + b \\ x-1 \end{array} \right. \\
 x^2 - ax + b = 0 \\
 (1)^2 - a(1) + b = 0 \\
 1 - a + b = 0 \\
 a = 1 + b \\
 \lim_{x \rightarrow 1} (x-b) = 0 \\
 1 - b = 0 \\
 b = 1 \\
 a = 1 + b = 2 \\
 a + b = 2 + 1 = 3
 \end{array}$$

- Q)** If  $\lim_{x \rightarrow 1} \frac{x^2 - ax + b}{x - 1} = 5$ , then  $a + b$  is equal to
- (a) - 4      (b) 1      (c) - 7      (d) 5

**Ans: (c)**

Q)  $\lim_{x \rightarrow 0} \frac{x \cot(4x)}{\sin^2 x \cot^2(2x)}$  is equal to

- (a) 0      (b) 1      (c) 4      (d) 2

$\left\{ \begin{array}{l} \text{If } x \rightarrow 0, \text{ then} \\ 2x \rightarrow 0, 4x \rightarrow 0 \end{array} \right\}$

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1 ; \quad \lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$$

$$\frac{x \cdot \tan^2 2x}{\tan 4x \sin^2 x} = \left[ \frac{1}{4} \frac{4x}{\tan 4x} \right] \times \left[ \frac{1}{\left( \frac{\sin x}{x} \right)^2} \cdot \frac{1}{x^2} \right] \times \left[ \left( \frac{\tan 2x}{2x} \right)^2 \times (2x)^2 \right]$$

$$= \frac{4x}{\tan 4x} \times \frac{1}{\left( \frac{\sin x}{x} \right)^2} \times \left( \frac{\tan 2x}{2x} \right)^2 = \frac{1}{\left( \frac{\tan 4x}{4x} \right)} \times \frac{1}{\left( \frac{\sin x}{x} \right)^2} \times \left( \frac{\tan 2x}{2x} \right)^2$$

$$= 1 \times 1 \times 1 = 1$$

Q)  $\lim_{x \rightarrow 0} \frac{x \cot(4x)}{\sin^2 x \cot^2(2x)}$  is equal to

- (a) 0                  (b) 1                  (c) 4                  (d) 2

**Ans: (b)**

Q) The value of  $\lim_{x \rightarrow 0} \frac{\sqrt{\frac{1}{2}(1 - \cos^2 x)}}{x}$  is

- (a) 1
- (b) -1
- (c) 0
- (d) None of these

$$\frac{\frac{1}{\sqrt{2}} |\sin x|}{x}$$

$$\underset{h \rightarrow 0}{\text{LHL}} \quad \frac{\frac{1}{\sqrt{2}} \sin h}{(-h)}$$

$$= \lim_{h \rightarrow 0} \frac{\frac{1}{\sqrt{2}} \left( \frac{\sin h}{h} \right)}{-1} = -\frac{1}{\sqrt{2}}$$

$$\underset{h \rightarrow 0}{\text{RHL}} \quad \frac{\frac{1}{\sqrt{2}} \sin h}{h} = +\frac{1}{\sqrt{2}}$$

Limit does not exist.

**Q)** The value of  $\lim_{x \rightarrow 0} \frac{\sqrt{\frac{1}{2}(1 - \cos^2 x)}}{x}$  is

- (a) 1
- (b) -1
- (c) 0
- (d) None of these

**Ans: (d)**

Q)  $\lim_{n \rightarrow \infty} \left( \frac{1}{1-n^2} + \frac{2}{1-n^2} + \dots + \frac{n}{1-n^2} \right)$  is equal to

- (a) 0
- (b)  $-\frac{1}{2}$
- (c)  $\frac{1}{2}$
- (d) None of these

$$\lim_{n \rightarrow \infty} \frac{n(1+n)}{2} = \frac{n}{2(1-n)} = \frac{n}{2n\left(\frac{1}{n} - 1\right)} = \frac{1}{2\left(\frac{1}{n} - 1\right)}$$

$(1+n)(1-n)$

$n \rightarrow \infty \Rightarrow \frac{1}{n} \rightarrow 0$

$$= \frac{1}{2(0-1)} = -\frac{1}{2}$$

Q)  $\lim_{n \rightarrow \infty} \left( \frac{1}{1-n^2} + \frac{2}{1-n^2} + \dots + \frac{n}{1-n^2} \right)$  is equal to

- (a) 0
- (b)  $-\frac{1}{2}$
- (c)  $\frac{1}{2}$
- (d) None of these

**Ans: (b)**

**Q)** If  $f(a) = 2$ ,  $f'(a) = 1$ ,  $g(a) = -1$ ,  $g'(a) = 2$ ,

then the value of  $\lim_{x \rightarrow a} \frac{g(x) f(a) - g(a) f(x)}{x - a}$  is



$$\lim_{x \rightarrow a} \frac{f(a)g'(x) - g(a)f'(x)}{1} \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{L-Hospital rule}$$

$$= f(a)g'(a) - g(a)f'(a) = 2 \times 2 - (-1)(1)$$

$$= 4 + 1 = \textcircled{5}$$

**Q)** If  $f(a) = 2$ ,  $f'(a) = 1$ ,  $g(a) = -1$ ,  $g'(a) = 2$ ,

then the value of  $\lim_{x \rightarrow a} \frac{g(x) f(a) - g(a) f(x)}{x - a}$  is



**Ans: (c)**

**Q)** If  $f(x) = \begin{cases} \frac{2^x - 1}{\sqrt{1+x} - 1}, & -1 \leq x < \infty, x \neq 0 \\ k, & x = 0 \end{cases}$  is

continuous everywhere, then  $k$  is equal to

- (a)  $\frac{1}{2} \log 2$
- (b)  $\log 4$
- (c)  $\log 8$
- (d)  $\log 2$

$$k = \lim_{x \rightarrow 0} \frac{2^x - 1}{\sqrt{1+x} - 1} \quad \left( \frac{0}{0} \text{ form, applying L-Hopital rule} \right)$$

$$k = \lim_{x \rightarrow 0} \frac{\frac{d}{dx}(2^x - 1) - 0}{\frac{d}{dx}(\sqrt{1+x} - 1) - 0} = \frac{\log_e 2}{\frac{1}{2}} = 2 \log_e 2 = \log_e 2^2 = \log 4$$

**Q)** If  $f(x) = \begin{cases} \frac{2^x - 1}{\sqrt{1+x} - 1}, & -1 \leq x < \infty, x \neq 0 \\ k, & x = 0 \end{cases}$  is

continuous everywhere, then  $k$  is equal to

- (a)  $\frac{1}{2} \log 2$
- (b)  $\log 4$
- (c)  $\log 8$
- (d)  $\log 2$

**Ans: (b)**

**Q)** If  $\lim_{x \rightarrow 0} \frac{\log(3+x) - \log(3-x)}{x} = k$ , the value of  $k$  is

- (a)  $-\frac{2}{3}$       (b) 0      (c)  $-\frac{1}{3}$

(d)  $\frac{2}{3}$

$\frac{0}{0}$  form,

$$\lim_{x \rightarrow 0} \underbrace{\frac{1}{3+x} - \frac{1}{3-x} \cdot (-1)}_1 = k$$

$$\left\{ \begin{array}{l} \lim_{x \rightarrow 0} \frac{1}{3+x} + \frac{1}{3-x} = k \\ k = \frac{1}{3} + \frac{1}{3} = \underline{\frac{2}{3}} \end{array} \right.$$

**Q)** If  $\lim_{x \rightarrow 0} \frac{\log(3+x) - \log(3-x)}{x} = k$ , the value of  $k$  is

- (a)  $-\frac{2}{3}$       (b) 0      (c)  $-\frac{1}{3}$       (d)  $\frac{2}{3}$

**Ans: (d)**

**Q)** If  $\lim_{x \rightarrow a} \left[ \frac{f(x)}{g(x)} \right]$  exists, then which one of the following correct ?

- (a) Both  $\lim_{x \rightarrow a} f(x)$  and  $\lim_{x \rightarrow a} g(x)$  must exist
- (b)  $\lim_{x \rightarrow a} f(x)$  need not exist but  $\lim_{x \rightarrow a} g(x)$  must exist
- (c) Both  $\lim_{x \rightarrow a} f(x)$  and  $\lim_{x \rightarrow a} g(x)$  need not exist
- (d)  $\lim_{x \rightarrow a} f(x)$  must exist but  $\lim_{x \rightarrow a} g(x)$  need not exist

**Q)** If  $\lim_{x \rightarrow a} \left[ \frac{f(x)}{g(x)} \right]$  exists, then which one of the following correct ?

- (a) Both  $\lim_{x \rightarrow a} f(x)$  and  $\lim_{x \rightarrow a} g(x)$  must exist
- (b)  $\lim_{x \rightarrow a} f(x)$  need not exist but  $\lim_{x \rightarrow a} g(x)$  must exist
- (c) Both  $\lim_{x \rightarrow a} f(x)$  and  $\lim_{x \rightarrow a} g(x)$  need not exist
- (d)  $\lim_{x \rightarrow a} f(x)$  must exist but  $\lim_{x \rightarrow a} g(x)$  need not exist

**Ans: (a)**

Q) What is  $\lim_{x \rightarrow 0} e^{-\frac{1}{x^2}}$  equal to?

- (a) 0
- (b) 1
- (c) -1
- (d) Limit does not exist

$$\lim_{x \rightarrow 0} e^{-\frac{1}{x^2}} = e^{-\infty} =$$

$$\begin{aligned} & x \uparrow & e^x & \uparrow \\ & x \uparrow & e^{-x} = e^{-\frac{1}{x^2}} & \downarrow \\ x \rightarrow \infty & \text{for } \left\{ e^{-x} \rightarrow 0 \right\} \end{aligned}$$

Q) What is  $\lim_{x \rightarrow 0} e^{-\frac{1}{x^2}}$  equal to?

- (a) 0
- (b) 1
- (c) -1
- (d) Limit does not exist

**Ans: (a)**

**Q)** The function  $f(x)$  is given by

$$f(x) = \begin{cases} x^2, & \text{if } x \text{ is rational} \\ -x^2, & \text{if } x \text{ is irrational} \end{cases}$$

- (a) continuous at  $x = 0$
- (b) continuous at  $x = \frac{1}{2}$
- (c) discontinuous at  $x = 0$
- (d) None of the above

**Q)** The function  $f(x)$  is given by

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- (a) continuous at  $x = 0$
- (b) continuous at  $x = \frac{1}{2}$
- (c) discontinuous at  $x = 0$
- (d) None of the above

**Ans: (a)**

**Q)** If the function  $f(x) = \frac{2x - \sin^{-1} x}{2x + \tan^{-1} x}$ , ( $x \neq 0$ ) is

continuous at each point of its domain, then the value of  $f(0)$  is

- (a) 2      (b) 1/3      (c) 2/3      (d) -1/3

$$f(x) = \frac{2x - \sin^{-1} x}{2x + \tan^{-1} x}$$

$\left( \frac{0}{0} \text{ form} \right)$

$$\begin{aligned}
 f(0) &= \lim_{x \rightarrow 0} f(x) = \frac{2 - \frac{1}{\sqrt{1-x^2}}}{2 + \frac{1}{1+x^2}} \\
 &= \frac{2 - \frac{1}{\sqrt{1-0}}}{2 + \frac{1}{1+0}} = \frac{1}{2+1} = \frac{1}{3} \quad \text{Ans}
 \end{aligned}$$

**Q)** If the function  $f(x) = \frac{2x - \sin^{-1} x}{2x + \tan^{-1} x}$ , ( $x \neq 0$ ) is

continuous at each point of its domain, then the value of  $f(0)$  is

- (a) 2
- (b) 1/3
- (c) 2/3
- (d) -1/3

**Ans: (b)**

Q) What is  $\lim_{\theta \rightarrow 0} \frac{\sqrt{1 - \cos \theta}}{\theta}$  equal to?

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

Q) What is  $\lim_{\theta \rightarrow 0} \frac{\sqrt{1 - \cos \theta}}{\theta}$  equal to?

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

**Ans: (c)**

**Q)**  $f(x) = \cos(|x|)$  is a continuous function because

- (a) composition of continuous functions is a continuous function
- (b) product of continuous functions is a continuous function
- (c) cosine is an even function
- (d) sum of continuous functions is continuous

**Q)**  $f(x) = \cos(|x|)$  is a continuous function because

- (a) composition of continuous functions is a continuous function
- (b) product of continuous functions is a continuous function
- (c) cosine is an even function
- (d) sum of continuous functions is continuous

**Ans: (a)**

Q) What is  $\lim_{x \rightarrow -1} \frac{x^3 + x^2}{x^2 + 3x + 2}$  equal to?

- (a) 0
- (b) 1
- (c) 2
- (d) 3

Q) What is  $\lim_{x \rightarrow -1} \frac{x^3 + x^2}{x^2 + 3x + 2}$  equal to?

- (a) 0
- (b) 1
- (c) 2
- (d) 3

**Ans: (b)**

**Q)** Let  $f(x)$  be defined as follows

$$f(x) = \begin{cases} 2x + 1, & -3 < x < -2 \\ x - 1, & -2 \leq x < 0 \\ x + 2, & 0 \leq x < 1 \end{cases}$$

Which one of the following statements is correct in respect of the above function?

- (a) It is discontinuous at  $x = -2$  but continuous at every other point.
- (b) It is continuous only in the interval  $(-3, -2)$ .
- (c) It is discontinuous at  $x = 0$  but continuous at every other point.
- (d) It is discontinuous at every point.

**Q)** Let  $f(x)$  be defined as follows

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- (b) It is continuous only in the interval  $(-3, -2)$ .
- (c) It is discontinuous at  $x = 0$  but continuous at every other point.
- (d) It is discontinuous at every point.

**Ans: (c)**

**Q)** If  $f(x) = \begin{cases} \frac{3x + 4 \tan x}{x}; & x \neq 0 \\ k; & x = 0 \end{cases}$  is continuous at  $x = 0$ ,

then the value of  $k$  is

- |         |         |
|---------|---------|
| (a) 7   | (b) 6   |
| (c) - 5 | (d) - 1 |

**Q)** If  $f(x) = \begin{cases} \frac{3x + 4 \tan x}{x}; & x \neq 0 \\ k; & x = 0 \end{cases}$  is continuous at  $x = 0$ ,

then the value of  $k$  is

- |         |         |
|---------|---------|
| (a) 7   | (b) 6   |
| (c) - 5 | (d) - 1 |

**Ans: (a)**

**Q)** If  $G(x) = -\sqrt{25 - x^2}$ , then  $\lim_{x \rightarrow 1} \frac{G(x) - G(1)}{x - 1}$  has the value

- (a)  $\frac{1}{\sqrt{24}}$
- (b)  $\frac{1}{5}$
- (c)  $-\sqrt{24}$
- (d) None of these

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- (a)  $\frac{1}{\sqrt{24}}$
- (b)  $\frac{1}{5}$
- (c)  $-\sqrt{24}$
- (d) None of these

**Ans: (a)**

**Q)** If  $f(x) = \frac{[x]}{|x|}$ ,  $x \neq 0$ ,

where  $[ ]$  denotes the greatest integer function, then what is the right-hand limit of  $f(x)$  at  $x = 1$ ?

- (a) -1
- (b) 0
- (c) 1
- (d) Right-hand limit of  $f(x)$  at  $x = 1$  does not exist

**Q)** If  $f(x) = \frac{[x]}{|x|}$ ,  $x \neq 0$ ,

where  $[ ]$  denotes the greatest integer function, then what is the right-hand limit of  $f(x)$  at  $x = 1$ ?

- (a) -1
- (b) 0
- (c) 1
- (d) Right-hand limit of  $f(x)$  at  $x = 1$  does not exist

**Ans: (c)**

**Q)** Consider the following function  $f: R \rightarrow R$  such that

$f(x) = x$  if  $x \geq 0$  and  $f(x) = -x^2$  if  $x < 0$ . Then, which one of the following is correct?

- (a)  $f(x)$  is continuous at every  $x \in R$
- (b)  $f(x)$  is continuous at  $x = 0$  only
- (c)  $f(x)$  is discontinuous at  $x = 0$  only
- (d)  $f(x)$  is discontinuous at every  $x \in R$

**Q)** Consider the following function  $f: R \rightarrow R$  such that

$f(x) = x$  if  $x \geq 0$  and  $f(x) = -x^2$  if  $x < 0$ . Then, which one of the following is correct?

- (a)  $f(x)$  is continuous at every  $x \in R$
- (b)  $f(x)$  is continuous at  $x = 0$  only
- (c)  $f(x)$  is discontinuous at  $x = 0$  only
- (d)  $f(x)$  is discontinuous at every  $x \in R$

**Ans: (a)**

**Q)** A function  $f$  is defined as follows

$$f(x) = x^p \cos\left(\frac{1}{x}\right), x \neq 0, f(0) = 0.$$

What conditions should be imposed on  $p$ , so that  $f$  may be continuous at  $x = 0$ ?

- (a)  $p = 0$
- (b)  $p > 0$
- (c)  $p < 0$
- (d) No value of  $p$

**Q)** A function  $f$  is defined as follows

$$f(x) = x^p \cos\left(\frac{1}{x}\right), x \neq 0, f(0) = 0.$$

What conditions should be imposed on  $p$ , so that  $f$  may be continuous at  $x = 0$ ?

- (a)  $p = 0$
- (b)  $p > 0$
- (c)  $p < 0$
- (d) No value of  $p$

**Ans: (b)**

**Q)** The function  $f(x) = \frac{\log(1+ax) - \log(1-bx)}{x}$

is not defined at  $x=0$ . The value which should be assigned to  $f$  at  $x=0$ , so that it is continuous at  $x=0$ , is

- (a)  $a - b$
- (b)  $a + b$
- (c)  $\log a + \log b$
- (d) None of these

**Q)** The function  $f(x) = \frac{\log(1+ax) - \log(1-bx)}{x}$

is not defined at  $x=0$ . The value which should be assigned to  $f$  at  $x=0$ , so that it is continuous at  $x=0$ , is

- (a)  $a - b$
- (b)  $a + b$
- (c)  $\log a + \log b$
- (d) None of these

**Ans: (b)**

**Q)**  $\lim_{x \rightarrow 0} \frac{\sin(\pi \cos^2 x)}{x^2}$  is equal to:

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

**Q)**  $\lim_{x \rightarrow 0} \frac{\sin(\pi \cos^2 x)}{x^2}$  is equal to:

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

**Ans: (b)**

Q) What is  $\lim_{x \rightarrow \frac{\pi}{6}} \frac{2 \sin^2 x + \sin x - 1}{2 \sin^2 x - 3 \sin x + 1}$  equal to?

- (a)  $-\frac{1}{2}$       (b)  $-\frac{1}{3}$       (c)  $-2$       (d)  $-3$

Q) What is  $\lim_{x \rightarrow \frac{\pi}{6}} \frac{2 \sin^2 x + \sin x - 1}{2 \sin^2 x - 3 \sin x + 1}$  equal to?

- (a)  $-\frac{1}{2}$       (b)  $-\frac{1}{3}$       (c)  $-2$       (d)  $-3$

**Ans: (d)**

**Q)**  $\lim_{x \rightarrow 0} \frac{\sin^{-1} x - \tan^{-1} x}{x^3}$  is equal to

(a) 0      (b) 1      (c) -1      (d) 1/2

- Q)**  $\lim_{x \rightarrow 0} \frac{\sin^{-1} x - \tan^{-1} x}{x^3}$  is equal to
- (a) 0      (b) 1      (c) -1      (d) 1/2

**Ans: (d)**

**Q)** Consider the function

$$f(x) = \begin{cases} ax - 2 & \text{for } -2 < x < -1 \\ -1 & \text{for } -1 \leq x \leq 1 \\ a + 2(x-1)^2 & \text{for } 1 < x < 2 \end{cases}$$

What is the value of  $a$  for which  $f(x)$  is continuous at  $x = -1$  and  $x = 1$ ?

- |        |       |
|--------|-------|
| (a) -1 | (b) 1 |
| (c) 0  | (d) 2 |

**Q)** Consider the function

$$f(x) = \begin{cases} ax - 2 & \text{for } -2 < x < -1 \\ -1 & \text{for } -1 \leq x \leq 1 \\ a + 2(x-1)^2 & \text{for } 1 < x < 2 \end{cases}$$

What is the value of  $a$  for which  $f(x)$  is continuous at  $x = -1$  and  $x = 1$ ?

- |        |       |
|--------|-------|
| (a) -1 | (b) 1 |
| (c) 0  | (d) 2 |

**Ans: (a)**

**Q)** If  $\lim_{x \rightarrow \infty} \left[ \frac{x^3 + 1}{x^2 + 1} - (ax + b) \right] = 2$ , then

- (a)  $a = 1$  and  $b = 1$
- (b)  $a = 1$  and  $b = -1$
- (c)  $a = 1$  and  $b = -2$
- (d)  $a = 1$  and  $b = 2$

**Q)** If  $\lim_{x \rightarrow \infty} \left[ \frac{x^3 + 1}{x^2 + 1} - (ax + b) \right] = 2$ , then

- (a)  $a = 1$  and  $b = 1$
- (b)  $a = 1$  and  $b = -1$
- (c)  $a = 1$  and  $b = -2$
- (d)  $a = 1$  and  $b = 2$

**Ans: (c)**

**Q)** What is  $\lim_{n \rightarrow \infty} \frac{a^n + b^n}{a^n - b^n}$

where  $a > b > 1$ , equal to?

- (a) -1
- (b) 0
- (c) 1
- (d) Limit does not exist

**Q)** What is  $\lim_{n \rightarrow \infty} \frac{a^n + b^n}{a^n - b^n}$

where  $a > b > 1$ , equal to?

- (a) -1
- (b) 0
- (c) 1
- (d) Limit does not exist

**Ans: (c)**

**Q)** Let  $f(x) = \begin{cases} 1 + \frac{x}{2k}, & 0 < x < 2 \\ kx, & 2 \leq x < 4 \end{cases}$

If  $\lim_{x \rightarrow 2} f(x)$  exists, then what is the value of  $k$ ?

- (a) -2
- (b) -1
- (c) 0
- (d) 1

**Q)** Let  $f(x) = \begin{cases} 1 + \frac{x}{2k}, & 0 < x < 2 \\ kx, & 2 \leq x < 4 \end{cases}$

If  $\lim_{x \rightarrow 2} f(x)$  exists, then what is the value of  $k$ ?

- (a) -2
- (b) -1
- (c) 0
- (d) 1

**Ans: (d)**

**Q)** Consider the following statements  
in respect of the function.

$$f(x) = \sin\left(\frac{1}{x^2}\right), x \neq 0.$$

1. It is continuous at  $x = 0$ ,  
if  $f(0) = 0$ .
2. It is continuous at  $x = \frac{2}{\sqrt{x}}$ .

Which of the above statements  
is/are correct?

- (a) 1 only      (b) 2 only  
(c) Both 1 and 2      (d) Neither 1 nor 2

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**Ans: (b)**

**Q)** If  $f(x) = \sqrt{25 - x^2}$ , then what is  $\lim_{x \rightarrow 1} \frac{f(x) - f(1)}{x - 1}$  equal to?

- (a)  $-\frac{1}{\sqrt{24}}$       (b)  $\frac{1}{\sqrt{24}}$       (c)  $-\frac{1}{4\sqrt{3}}$       (d)  $\frac{1}{\sqrt{4\sqrt{3}}}$

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**Ans: (a)**

# REVISION TOPICS : (21/08/24)

- **Differentiability and Differentiation**

# NDA 2 2024

LIVE

# MATHS REVISION

CLASS 11

NAVJYOTI SIR

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