

AFCAT 1 2025

MATHS

PROGRESSIONS

MCQS



NAVJYOTI SIR



11 Feb 2025 Live Classes Schedule

- ✓ 9:00AM --- 11 FEBRUARY 2025 DAILY DEFENCE UPDATES --- DIVYANSHU SIR
- ✓ 10:00AM --- 11 FEBRUARY 2025 DAILY CURRENT AFFAIRS --- RUBY MA'AM

SSB INTERVIEW LIVE CLASSES

- ✓ 9:30AM --- OVERVIEW OF SRT & SDT --- ANURADHA MA'AM

AFCAT 1 2025 LIVE CLASSES

- ✓ 3:00PM --- STATIC GK - SCIENTIFIC INVENTIONS --- DIVYANSHU SIR
- ✓ 4:30PM --- ENGLISH - CLOZE TEST - CLASS 1 --- ANURADHA MA'AM
- 5:30PM --- MATHS - PROGRESSIONS --- NAVJYOTI SIR

NDA 1 2025 LIVE CLASSES

- ✓ 10:00AM --- MATHS - MATRICES & DETERMINANTS - CLASS 2 --- NAVJYOTI SIR
- ✓ 11:30AM --- POLITY - CLASS 4 --- RUBY MA'AM
- ✓ 1:00PM --- BIOLOGY - CLASS 2 --- SHIVANGI MA'AM
- ✓ 4:30PM --- ENGLISH - CLOZE TEST - CLASS 1 --- ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

- ✓ 11:30AM --- POLITY - CLASS 4 --- RUBY MA'AM
- ✓ 1:00PM --- BIOLOGY - CLASS 2 --- SHIVANGI MA'AM
- ✓ 1:30PM --- ENGLISH - CLOZE TEST - CLASS 1 --- ANURADHA MA'AM



DECIMAL – FRACTIONS

SIMPLIFICATION

ALGEBRAIC IDENTITIES

If all the fractions $\frac{3}{5}, \frac{1}{8}, \frac{8}{11}, \frac{4}{9}, \frac{2}{7}, \frac{5}{12}$ and $\frac{5}{12}$ are arranged in the descending order of their values, which one will be the third?

descending - large to small

(a) $\frac{1}{8}$

(b) $\frac{4}{9}$

(c) $\frac{5}{12}$

(d) $\frac{8}{11}$

$\frac{3}{5} = 0.60$

$\frac{8}{11} = 0.72$

$\frac{2}{7} = 0.28$

$\frac{1}{8} = 0.125$

$\frac{4}{9} = 0.44$

$\frac{5}{12} = 0.41$

If all the fractions $\frac{3}{5}, \frac{1}{8}, \frac{8}{11}, \frac{4}{9}, \frac{2}{7}, \frac{5}{12}$ and $\frac{5}{12}$ are arranged in the descending order of their values, which one will be the third?

(a) $\frac{1}{8}$

(b) $\frac{4}{9}$

(c) $\frac{5}{12}$

(d) $\frac{8}{11}$

ANSWER : B

If $p = \frac{5}{8}$, $q = \frac{7}{12}$, $r = \frac{13}{16}$ and $s = \frac{16}{29}$ then

- (a) $p < q < r < s$ (b) $s < q < p < r$
(c) $p < r < q < s$ (d) $s < r < p < q$

$$p = 0.625 \text{ (2)}$$

$$q = 0.58 \text{ (3)}$$

$$r > p > q > s$$

$$r = 0.81 \text{ (1)}$$

$$s = 0.55 \text{ (4)}$$

If $p = \frac{5}{8}$, $q = \frac{7}{12}$, $r = \frac{13}{16}$ and $s = \frac{16}{29}$ then

- (a) $p < q < r < s$ (b) $s < q < p < r$
(c) $p < r < q < s$ (d) $s < r < p < q$

ANSWER : B

$$\frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72} + \frac{1}{90} + \frac{1}{110} = ?$$

(a) $\sqrt{2} \frac{2}{27}$

(b) $\frac{1}{9}$

(c) $\frac{5}{27}$

(d) $\frac{6}{55}$

$$\frac{1}{6 \times 5} + \frac{1}{7 \times 6} + \frac{1}{8 \times 7} + \frac{1}{9 \times 8} + \frac{1}{10 \times 9} + \frac{1}{11 \times 10}$$

$$\left(\frac{1}{5} - \frac{1}{6} \right) + \left(\frac{1}{6} - \frac{1}{7} \right) + \left(\frac{1}{7} - \frac{1}{8} \right) + \left(\frac{1}{8} - \frac{1}{9} \right) + \left(\frac{1}{9} - \frac{1}{10} \right) + \left(\frac{1}{10} - \frac{1}{11} \right)$$

$$\frac{1}{5} - \frac{1}{11}$$

$$= \frac{6}{55}$$

$$\frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72} + \frac{1}{90} + \frac{1}{110} = ?$$

(a) $\sqrt{2} \frac{2}{27}$

(b) $\frac{1}{9}$

(c) $\frac{5}{27}$

(d) $\frac{6}{55}$

ANSWER : D

The value of $(4.7 \times 13.26 + 4.7 \times 9.43 + 4.7 \times 77.31)$ is :

- (a) 0.47 (b) 47
(c) 470 (d) 4700

$$\begin{aligned} & 4.7(13.26 + 9.43 + 77.31) \\ &= (4.7)(100.00) \\ &= \underline{470} \end{aligned}$$

$$\begin{aligned} & axb + axc + axd \\ &= a(b+c+d) \end{aligned}$$

Simplify: $\frac{0.2 \times 0.2 + 0.2 \times 0.02}{0.044}$

(a) 0.004

(b) 0.4

(c) 1

(d) 2

$$= \frac{0.\overbrace{04} + 0.\overbrace{004}}{0.044} = \frac{0.044}{0.044} = 1$$

Simplify: $\frac{0.2 \times 0.2 + 0.2 \times 0.02}{0.044}$

(a) 0.004

(b) 0.4

(c) 1

(d) 2

ANSWER : C

$$\frac{(36.54)^2 - (3.46)^2}{?} = 40$$

(a) 3.308

(b) 4

(c) 33.08

(d) 330.8

$$\frac{(36.54 + 3.46)(36.54 - 3.46)}{x} = 40$$

$$x = \frac{(40)(33.08)}{(40)} = 33.08$$

$$\frac{(36.54)^2 - (3.46)^2}{?} = 40 .$$

(a) 3.308

(b) 4

(c) 33.08

(d) 330.8

ANSWER : C

The value of $\left(\frac{0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02}{0.2 \times 0.2 \times 0.2 + 0.04 \times 0.04 \times 0.04} \right)$ is:

- (a) 0.0125 (b) 0.125
(c) 0.25 (d) 0.5

$$\frac{\cancel{0.1 \times 0.1 \times 0.1} + \cancel{0.02 \times 0.02 \times 0.02}}{8(\cancel{0.1 \times 0.1 \times 0.1} + \cancel{0.02 \times 0.02 \times 0.02})} = \frac{1}{8} = 0.125$$

The value of $\left(\frac{0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02}{0.2 \times 0.2 \times 0.2 + 0.04 \times 0.04 \times 0.04} \right)$ is:

- (a) 0.0125 (b) 0.125
(c) 0.25 (d) 0.5

ANSWER : B

The value of $\left(\frac{8.94 \times 8.94 \times 8.94 - 3.56 \times 3.56 \times 3.56}{8.94 \times 8.94 + 8.94 \times 3.56 + 3.56 \times 3.56} \right)$ is:

(a) 0.538

(b) 5.38

(c) 0.0538

(d) 53.8

$$\frac{a^3 - b^3}{a^2 + ab + b^2} = (a - b)$$

$$= 8.94 - 3.56$$

$$= \underline{\underline{5.38}}$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

$$a^2 - b^2 = (a+b)(a-b)$$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

$$(a+b)^3 = a^3 + b^3 + 3a^2b + 3ab^2$$

$$(a-b)^3 = a^3 - b^3 - 3a^2b + 3ab^2$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2 = \left(x - \frac{1}{x}\right)^2 + 2$$

$$x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)^3 - 3\left(x + \frac{1}{x}\right)$$

$$x^3 - \frac{1}{x^3} = \left(x - \frac{1}{x}\right)^3 + 3\left(x - \frac{1}{x}\right)$$

$$a^3 + b^3 + c^3 - 3abc = \underbrace{(a+b+c)} \left(a^2 + b^2 + c^2 - ab - bc - ca \right)$$

$$\text{If } a+b+c = 0$$

$$\underbrace{a^3 + b^3 + c^3 = 3abc}$$

The value of $\left(\frac{8.94 \times 8.94 \times 8.94 - 3.56 \times 3.56 \times 3.56}{8.94 \times 8.94 + 8.94 \times 3.56 + 3.56 \times 3.56} \right)$ is:

- (a) 0.538 (b) 5.38
(c) 0.0538 (d) 53.8

ANSWER : B

The value of $\frac{(0.06)^2 + (0.47)^2 + (0.079)^2}{(0.006)^2 + (0.047)^2 + (0.0079)^2}$ is :

(a) 0.1

(b) 10

(c) 100

(d) 1000

$$\frac{\frac{36}{10000} + \frac{(47)^2}{10000} + \frac{(79)^2}{1000000}}{\frac{36}{1000000} + \frac{(47)^2}{1000000} + \frac{(79)^2}{100000000}}$$

$$= \frac{\cancel{36 \times 100} + \cancel{(47)^2 \times 100} + \cancel{(79)^2}}{\cancel{1000000}}$$

$$= \frac{\cancel{36 \times 100} + \cancel{(47)^2 \times 100} + \cancel{(79)^2}}{\cancel{100000000}}$$

$$= \frac{\frac{1}{1}}{\frac{1}{100}} = 100$$

The value of $\frac{(0.06)^2 + (0.47)^2 + (0.079)^2}{(0.006)^2 + (0.047)^2 + (0.0079)^2}$ is :

- (a) 0.1 (b) 10
(c) 100 (d) 1000

ANSWER : C

The value of

$$\frac{0.1 \times 0.1 \times 0.1 + 0.2 \times 0.2 \times 0.2 + 0.3 \times 0.3 \times 0.3 - 3 \times 0.1 \times 0.2 \times 0.3}{0.1 \times 0.1 + 0.2 \times 0.2 + 0.3 \times 0.3 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1}$$
 is

- (a) 0.006 (b) 0.6
 (c) 0 (d) 0.2

$$\frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} = a + b + c = 0.1 + 0.2 + 0.3 = 0.6$$

The value of

$$\frac{0.1 \times 0.1 \times 0.1 + 0.2 \times 0.2 \times 0.2 + 0.3 \times 0.3 \times 0.3 - 3 \times 0.1 \times 0.2 \times 0.3}{0.1 \times 0.1 + 0.2 \times 0.2 + 0.3 \times 0.3 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1}$$
 is

- (a) 0.006 (b) 0.6
(c) 0 (d) 0.2

ANSWER : B

The sum of squares of two numbers is 90 and their difference is 6.

What are the two numbers ?

A. 9,6

B. 9,3

C. 6,6

D. 5,4

$$x^2 + y^2 = 90$$

$$\underline{x - y = 6}$$

$$A.) \quad 9 - 6 = 3 \neq 6$$

$$B.) \quad 9 - 3 = 6 \text{ ————— } \underline{9^2 + 3^2 = 90}$$

$$C.) \quad 6 - 6 = 0$$

$$D.) \quad 5 - 4 = 1$$

The sum of squares of two numbers is 90 and their difference is 6.

What are the two numbers ?

A. 9,6

B. 9,3

C. 6,6

D. 5,4



AFCAT 1 2025

MAHA MARATHON

19 TO 21 FEB 2025

12 PM TO 01 PM

MATHS - NAVJYOTI SIR

01 PM TO 02 PM

ENGLISH - ANURADHA MA'AM

02 PM TO 03 PM

REASONING - RUBY MA'AM

03 PM TO 04 PM

STATIC GK - DIVYANSHU SIR

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