

115. If $(x^3 + y^3)^{\frac{2}{3}} = (x^2 + y^2)$, then the value of $\frac{x^2 + y^2}{xy}$ $x \neq 0, y \neq 0$, is:

यदि $\left[(x^3 + y^3)^{\frac{2}{3}}\right]^3 = \left[(x^2 + y^2)\right]^3$ तो $\frac{x^2 + y^2}{xy}$ $x \neq 0, y \neq 0$ का मान क्या होगा?

[A] $\frac{2}{3}$

[B] $x^2 + y$

[C] 1

[D] $x + y^2$

$$(x^3 + y^3)^2 = (x^2 + y^2)^3$$

$$\cancel{x^6 + y^6} + 2x^3y^3 = \cancel{x^6 + y^6} + 3x^2y^2(x + y)$$

$$\frac{2}{3} = \frac{(x^2 + y^2)}{xy}$$

116. If $a^3 + 3a^2 + 3a = 63$, then the value of $a^2 + 2a$ is:

यदि $a^3 + 3a^2 + 3a = 63$, तो $a^2 + 2a$ का मान है-

SSC CHSL TIER – I 2022 $= 9+6$

[A] 22

[C] 15 ✓

[B] 19

[D] 8

$$(a+1)^3 = 64$$

$$a+1=4$$

$$a=3$$

117. If the difference between two numbers is 5 and the difference their cubes is 1850, then the difference between their squares is:

यदि दो संख्याओं का अंतर 5 है और उनके घनों का अंतर 1850 है, तो उनके वर्गों के मध्य कितना अंतर होगा?

[A] $5\sqrt{482}$ $a > b$

[B] $5\sqrt{483}$

[C] $5\sqrt{484}$

[D] $5\sqrt{485}$

$$a - b = 5, \quad a^3 - b^3 = 1850$$

$$(a+b)^2 = 5^2 + 4 \times 115 = 485$$

$$a+b = \sqrt{485}$$

~~$5 \times (5^2 + 3ab) = 1850$~~

$$3ab = 345$$

$$ab = 115$$

$$\begin{aligned} a^2 - b^2 &= (a-b) \cdot (a+b) \\ &= 5 \cdot \sqrt{485} \end{aligned}$$



118. If $a = 26$ and $b = 22$, then the value of $\frac{a^3 - b^3}{a^2 - b^2} - \frac{3ab}{a+b}$ is _____.

यदि $a = 26$ और $b = 22$ है, तो $\frac{a^3 - b^3}{a^2 - b^2} - \frac{3ab}{a+b}$ का मान _____ है।

(SSC CGL 2022)

[A] $5/3$

[C] $1/3$

[B] $13/11$

[D] $11/13$

$$\begin{aligned} & \frac{(a^3 - b^3)}{(a^2 - b^2)} - \frac{3ab}{a+b} \\ &= \frac{(a-b)^2}{a+b} \\ &= \frac{16}{48} = \frac{1}{3} \end{aligned}$$

119. What is the value of $\frac{1+x}{1-x^2} \div \frac{1+x}{1-x^4} - \frac{1-x^4}{1-x} \times \frac{(1+x)}{1-x^2}$?

$$\frac{1+x}{1-x^2} \div \frac{1+x}{1-x^4} - \frac{1-x^4}{1-x} \times \frac{(1+x)}{1-x^2}$$

का मान क्या है?

SSC CHSL TIER - I 2022

[A] $\frac{2x(1+x^2)}{(1-x)}$

~~[B] $\frac{2x(1+x^2)}{(x-1)}$~~

[C] $\frac{(1-x)^2}{(1-x)^2}$

~~[D] $\frac{(1+x^2)}{(1+x^2)}$~~

$\frac{1^2 - (2^2)^2}{1-2^2}$

$\frac{1+x}{1-x^2} \times \frac{1-x^4}{1+x}$

$\frac{2}{3} \div \frac{5}{7} = \frac{2}{3} \times \frac{7}{5}$

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

120. On simplification, $\frac{x^3-y^3}{x[(x+y)^2-3xy]} \div \frac{y[(x-y)^2+3xy]}{x^3+y^3} \times \frac{(x+y)^2-(x-y)^2}{x^2-y^2}$ is equal to :

$\frac{x^3-y^3}{x[(x+y)^2-3xy]} \div \frac{y[(x-y)^2+3xy]}{x^3+y^3} \times \frac{(x+y)^2-(x-y)^2}{x^2-y^2}$ का मान ज्ञात कीजिए ।

[A] 4

[B] 1

[C] $\frac{1}{2}$

[D] $\frac{1}{4}$

$$\frac{\cancel{x^3} \cancel{y^3}}{\cancel{x} \cdot \cancel{[(x+y)^2-3xy]}} \times \frac{\cancel{x^3} \cancel{y^3}}{\cancel{y} \cdot [(x-y)^2+3xy]} \times \frac{4xy}{\cancel{(x-y)} \cdot \cancel{(x+y)}}$$

$= 4$

121. If $P = \frac{x^3+y^3}{(x-y)^2+3xy}$, $Q = \frac{(x+y)^2-3xy}{x^3-y^3}$ and $R = \frac{(x+y)^2+(x-y)^2}{x^2-y^2}$, then what is the value of $(P \div Q) \times R$?

यदि $P = \frac{x^3+y^3}{(x-y)^2+3xy}$, $Q = \frac{(x+y)^2-3xy}{x^3-y^3}$ और $R = \frac{(x+y)^2+(x-y)^2}{x^2-y^2}$ है, तो $(P \div Q) \times R$ का मान क्या है?

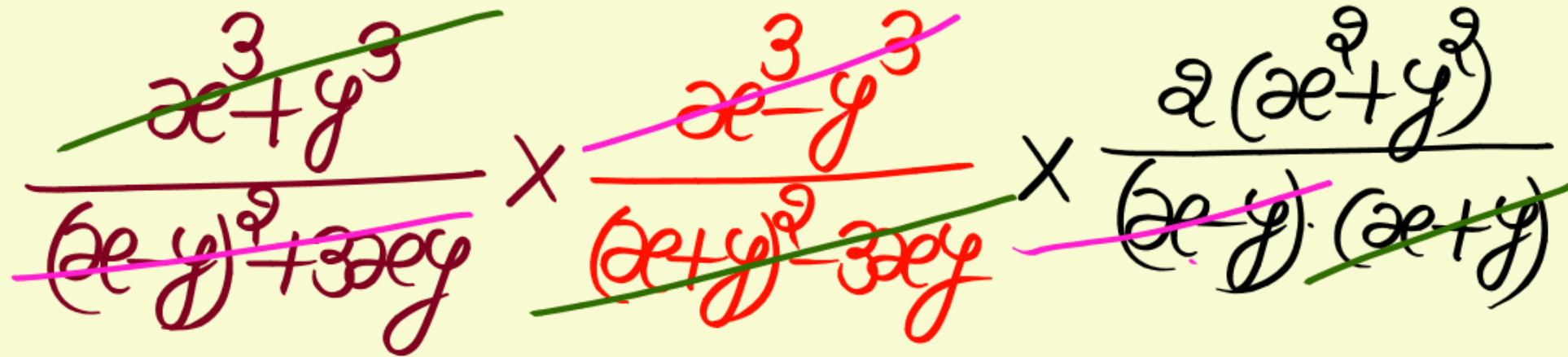
(2019 PRE)

[A] $2xy$

[C] $x^2 + y^2$

[B] $2(x^2 + y^2)$

[D] $4xy$


$$\frac{x^3+y^3}{(x-y)^2+3xy} \times \frac{(x+y)^2-3xy}{x^3-y^3} \times \frac{2(x^2+y^2)}{(x-y)(x+y)}$$

122. If $x = 3.5$, then what is the value of $\frac{x^2+3x+9}{x^2-25} \div \frac{x^3-27}{x^2+3x-10} \times \frac{(x-4)^2-1}{x^2-4} = ?$

यदि $x = 3.5$ हो, तो $\frac{x^2+3x+9}{x^2-25} \div \frac{x^3-27}{x^2+3x-10} \times \frac{(x-4)^2-1}{x^2-4}$ का मान कितना होगा?

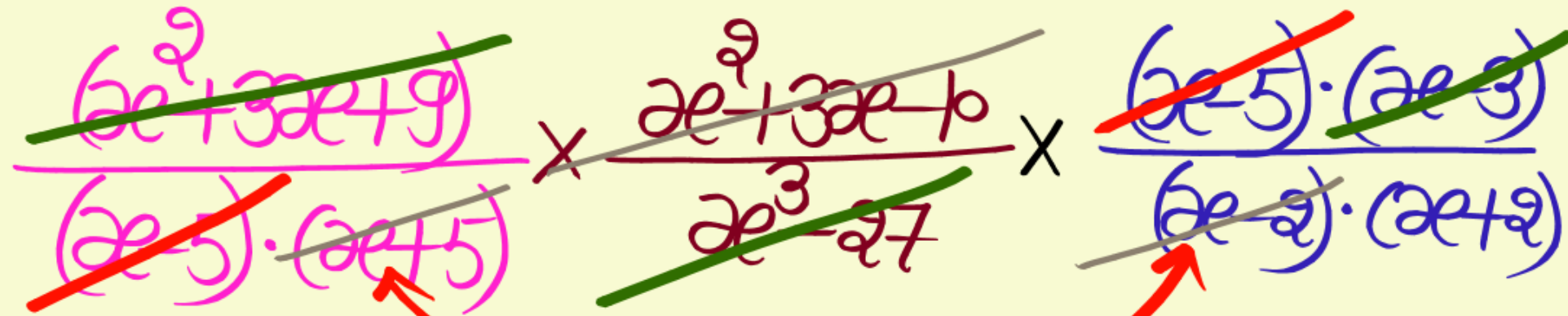
(ICAR Technician 2023)

[A] $2/9$

[B] $2/11$

[C] $1/4$

[D] $1/5$


$$\frac{(x^2+3x+9)}{(x-5) \cdot (x+5)} \times \frac{x^3-27}{x^2+3x-10} \times \frac{(x-5) \cdot (x-3)}{(x-3) \cdot (x+3)}$$

$$= \frac{1}{x+3} = \frac{1}{5.5} = \frac{1}{\frac{11}{2}} = \frac{2}{11}$$



123. If $x(x - 4) = 2$, then $x^6 - 88x^3 - 13 = ?$

यदि $x(x - 4) = 2$ है, तो $x^6 - 88x^3 - 13 = ?$

[A] -6

[B] -4

[C] -5

[D] -2

$$(x - 4)^3 = 2$$

$$x^6 - 64x^3 - 12x^3 \times 2 = 8$$

$$x^6 - 88x^3 = 8$$



124. If $x^2 - 2x + 4 = 0$, then $x^5 - 2x^4 + 30 = ?$

यदि $x^2 - 2x + 4 = 0$, तो $x^5 - 2x^4 + 30 = ?$

[A] 62

[C] 64

$$x^2 - 2x = -4$$

[B] 63

[D] 60

$$(x+2)(x^3 - 2x^2 + 4x - 8) = 0 \times (x+2)$$

$$x^3 + 2^3 = 0$$

$$x^3 = -8$$

$$\begin{aligned} & x^3 \cdot (x^2 - 2x) + 30 \\ & \downarrow \\ & = -8x - 4 + 30 \\ & = 60 \end{aligned}$$

$$ax^2 + bx + c = 0$$

$$\Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\sqrt{-1} = i$$



125. If $x^2 + 3x + 9 = 0$, then $x^5 + 3x^4 + 260 = ?$

यदि $x^2 + 3x + 9 = 0$ है तब $x^5 + 3x^4 + 260$ का मान ज्ञात करें?

[A] 17

[B] 23

[C] 19

[D] 14

$$(x-3) \cdot (x^2+3x+9) = 0 \times (x-3)$$

$$x^3 - 3^3 = 0$$

$$\Rightarrow x^3 = 27$$

$$\begin{aligned} & x^3 (x^2 + 3x) + 260 \\ &= 27x - 9 + 260 \\ &= -243 + 260 \\ &= 17 \end{aligned}$$

126. If $\frac{1}{x} + \frac{1}{7} = \frac{1}{x+7}$, then $x^{49} - 343x^{46} + x^3 + 17 = ?$

यदि $\frac{1}{x} + \frac{1}{7} = \frac{1}{x+7}$ है, तो $x^{49} - \cancel{x^3}x^{46} + x^3 + 17 = ?$
 $= 343 + 17$

[A] 289

[B] 0

[C] 360

[D] 326

$$\frac{x+7}{7x} = \frac{1}{x+7}$$

$$x^2 + 14x + 49 = 7x$$

$$(x-7)(x^2 + 7x + 49) = 0 \cdot (x-7)$$

$$x^3 - 7^3 = 0$$

$$\Rightarrow x^3 = 343$$