MATHS

BOOKS - ARIHANT PUBLICATION

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RATIONAL EXPRESSIONS

Solved Examples

1. Reduce $\frac{3x^2 - 11x - 4}{6x^2 - 7x - 3}$ to its lowest terms.

A. $\frac{x - 2}{2x - 3}$

B. $\frac{x - 4}{2x - 3}$

C. $\frac{x-1}{2x-3}$

D. $\frac{x-4}{x-3}$

Answer: B

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2. What should be subtracted from $\frac{7x}{x^2+x-12}$ to get $\frac{4}{x+4}$?

A. $\frac{2}{x-3}$

B. $\frac{2}{2x-3}$

C. $\frac{x+1}{x-3}$

D. $\frac{3}{x-3}$

Answer: D

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3. Find the product of $\frac{x^2-1}{x^2+1}$ and $\frac{x+2}{x+1}$

A. $\frac{x^2+x-2}{x^2+1}$

B. $\frac{x-2}{x^2+1}$

C. $\frac{x^2-2}{x^2+1}$

D. $\frac{x^2-2}{x+1}$

Answer: A

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4. If $R = \frac{x^2 + 2}{x - 3}$ and $S = \frac{x - 1}{x}$, then find

$(a) R + S$

$(b) R - S$

$(c) R.\ S$

$(d) \frac{R}{S}$

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Exam Booster For Cracking Exam

1. Which of the following algebraic expressions are polynomials?

I. $x^3 + \sqrt{3x} + 4$, II. $x^2 + 2\sqrt{x} + 4$

III. $x^2 + \sqrt{x-1}$, IV. $x^2 + 3x + 4$

A. I, II and III

B. Only IV

C. All of these

D. None of these

Answer: B

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2. Which of the following are rational expressions ?

I. $\frac{x^3 - 3x^2 + 2}{x^2 + 1}$, II. $\frac{z^3 - 3z^2}{2z + 3}$

III. $\frac{x^2 - x + 2}{x + 3}$, IV. $\frac{x^3 + 3x^2 - 1}{x^2 + \sqrt{x - 1}}$

A. I, II and III

B. Only IV

C. All of these

D. None of these

Answer: A

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3. If $A = \frac{x + 1}{x - 1}$ and $B = \frac{x - 1}{x + 1}$, then A + B is:

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

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

C. $\frac{x^2+1}{x^2-1}$

D. None of these

Answer: D

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4. If $R=\frac{a^3+1}{a-1}$ and $S=\frac{a^2-a+1}{a+1}$, then R + S is:

A. $\frac{a-1}{a+1}$

B. $\frac{1}{a^2+a+1}$

C. 1

D. $\frac{a\left(a^3+2a^2-2a+3\right)}{a^2-1}$

Answer: D

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5. The expression to be added to $\left(5x^2-7x+2\right)$ to produce $\left(7x^2-1\right)$ is:

A. $2x^2+7x-3$

B. $2x^2+3$

C. $2x^2-3$

D. $2x^2+7x$

Answer: A

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6. $\frac{x^2 - x - 2}{2x^2 + x - 3}$ in lowest term is:

A. $\frac{x - 1}{2x + 3}$

B. $\frac{x^2 - x - 2}{2x^2 + x - 3}$

C. $\frac{x - 2}{2x + 3}$

D. $\frac{x + 1}{x - 1}$

Answer: B

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7. The simplified form of $\frac{a+2}{a+3} - \frac{a+1}{a+2}$ is:

A. $\frac{1}{a^2+5a+6}$

B. $\frac{a+2}{a^2+5a+6}$

C. 0

D. $\frac{(a+2)^2}{a^2+5a+6}$

Answer: A

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8. $\left(\frac{x+1}{x^2-1} - \frac{2}{x}\right)$ expressed a rational expression is:

A. $\frac{x^2-2}{x(x^2-1)}$

B. $-\dfrac{x-2}{x(x-1)}$

C. $\dfrac{2(x+1)}{x^3-1}$

D. $\dfrac{1}{x(x+1)}$

Answer: B

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9. The product of additive inverse of $\dfrac{x+6}{x+2}$ and $\dfrac{5x+2}{5x-3}$ is:

A. $\dfrac{5x^2+32x+12}{5x^2-7x+6}$

B. $\dfrac{5x^2+32x+12}{5x^2+7x-6}$

C. $\dfrac{5x^2+32x+12}{5x^2+7x+6}$

D. None of these

Answer: B

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10. Which rational expression should be added to $\frac{x^3-1}{x^2+2}$ to get $\frac{2x^3-x^2+3}{x^2+2}$

A. 1

B. $\frac{x^3-x^2-4}{x^2+2}$

C. $\frac{x^3-x^2+4}{x^2+2}$

D. None of these

Answer: C

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11. The value of:

$$\left(1+\frac{1}{a+1}\right)\left(1+\frac{1}{a+2}\right)\left(1+\frac{1}{a+3}\right)\left(1+\frac{1}{a+4}\right)$$

is

A. $\frac{a+5}{a+1}$

B. $\frac{1}{a+1}$

C. $a+5$

D. None of these

Answer: A

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12. The expression $\frac{(x-1)(x-2)\left(x^2-9x+14\right)}{(x-7)(x^2-3x+2)}$ in the lowest terms is:

A. $x+2$

B. $x-3$

C. $x+3$

D. $x-2$

Answer: D

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13. The value of $\frac{a-c}{(a-b)(x-a)}+\frac{b-c}{(b-a)(x-b)}$ is:

A. $\frac{x-c}{(x-a)(x-b)}$

B. $\frac{x-a}{(x-b)(x-c)}$

C. $\frac{x-c}{(x-b)(a-x)}$

D. None of these

Answer: A

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14. The sum of the rational expression $\frac{x-3}{x^2+1}$ and its reciprocal is

A. $\frac{2x^2 - 6x + 10}{x - 3}$

B. $\frac{x^4 + 3x^2 - 6x + 10}{x^3 - 3x^2 + x - 3}$

C. $\frac{x^4 + 2x^2 - 6x - 10}{x^3 3x^2 + x - 3}$

D. None of these

Answer: B

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15. If $A = 4x + \frac{1}{x}$, then the value of $A + \frac{1}{A}$ is:

A. $\frac{x}{4x^2 + 1}$

B. $\frac{4x^2 + 1}{x}$

C. $\frac{1}{4x^3 + x}$

D. None of these

Answer: D

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16. If $x = \frac{b}{a - b}$ and $y = \frac{a}{a + b}$, then the value of $\frac{1}{x} + \frac{1}{y}$ is:

A. $\frac{a^2 + b^2}{ab}$

B. $\frac{b^2 - a^2}{ab}$

C. $\frac{a^2 - b^2}{ab}$

D. None of these

Answer: A

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17. The value of $\frac{a}{(a-b)(a-c)} + \frac{b}{(b-c)(b-a)} + \frac{c}{(c-a)(c-b)}$ is:

A. 0

B. 2

C. 1

D. None of these

Answer: A

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18. If $A = \left(\frac{x-1}{x+1}\right)$ and $B = \left(\frac{x+1}{x-1}\right)$, then the value of $(A+B)^2$ is:

A. $\frac{4x^2+8x^2+4}{x^2-2x-1}$

B. $\frac{4x^4+8x^2+4}{x^4+2x^2-1}$

C. $\frac{4x^4+8x^2+4}{x^4-2x^2+1}$

D. None of these

Answer: C

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19. The value of $\frac{1}{(1-a)(1-b)} + \frac{a^2}{(1-a)(b-a)} - \frac{b^2}{(b-1)(a-b)}$ is:

A. 1

B. 0

C. 2

D. 5

Answer: A

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20. The value of $\frac{\left(\frac{x}{y}-\frac{y}{x}\right)\left(\frac{y}{z}-\frac{z}{y}\right)\left(\frac{z}{x}-\frac{x}{z}\right)}{\left(\frac{1}{x^2}-\frac{1}{y^2}\right)\left(\frac{1}{y^2}-\frac{1}{z^2}\right)\left(\frac{1}{z^2}-\frac{1}{x^2}\right)}$ is

A. $x^2y^2z^2$

B. $-x^2y^2z^2$

C. $-x^2y^2$

D. None of these

Answer: B

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21. If α, β and γ are the roots of the cubic equation $(x-1)\left(x^2+x+3\right)=0$, then the value of $\alpha^3+\beta^3+\gamma^3$ is:

A. 3

B. 0

C. 9

D. None of these

Answer: C

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22. When $x^5 - 5x^4 + 9x^3 - 6x^2 - 16x + 13$ is divided by $x^2 - 3x + a$, then quotient and remainders are $x^3 - 2x^2 + x + 1$ and $-15x + 11$ respectively . Find the value of a .

A. 2

B. 5

C. 7

D. 9

Answer: A

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