MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

DIVISION OF ALGEBRAIC EXPRESSIONS

Others

1. determine whether following are polynomial or not $2\dfrac{x^2}{3} - 3\dfrac{x^2}{2} + x - 5$ (2)

$$\dfrac{x^3}{2} - 3x^2 + 5x^{\frac{1}{2}} + x - 1$$

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2. $3 - 2x^2 + 4x^2y + 8y - \dfrac{5}{3}xy^2$ is a polynomial in two variables x and y.

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3. determine the degree of following (1)$2x + 3$

(2)$2x^2 - 3x + \dfrac{7}{5}$ (3)$2\dfrac{a^2}{3} - 7\dfrac{a^2}{2} + 4$

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4. determine the degree (1)

$$3x^4 - 2x^3y^3 + 7xy^3 - 3x^2\dfrac{y^2}{4}$$

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5. $2 - \dfrac{3}{4}x, \ \dfrac{1}{2} + \dfrac{3}{5}y, \ 2 + 3a$ etc. are linear polynomials True/False ?.

6. $2x^2 - 3x + 4, \ 2 - x + x^2, \ 2y^2 - \dfrac{3}{2}y + \dfrac{1}{4}$ are quadratic polynomials.

7. $x^3 - 7x^2 + 2x - 3, \; 2 + \dfrac{1}{2}y - \dfrac{3}{2}y^2 + 4y^3$

are cubic polynomials True/False ?.

8. $\quad 3x^4 - 7x^3 + x^2 - x + 9, 4 - 2\dfrac{x^2}{3} + 3\dfrac{x^4}{5}$

are biquadratic polynomial

9. Write the degree of each of the following polynomials : $2x^2 + 5x^2 - 7$ (ii) $5x^2 - 3x + 2$ $2x + x^2 - 8$

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10. Write the degree of each of the following polynomials : $\frac{1}{2}y^7 - 12y^6 + 48y^5 - 10$ (ii) $3x^3 + 1\,5$ (iv) $20x^3 + 12x^2y^2 - 10y^2 + 20$

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11. Which of the following expressions are not polynomials? $x^2 + 2x^{-2}$ (ii) $\sqrt{a}x + x^2 - x^3$

$3y^3 - \sqrt{5}y + 9$ (iv) $ax^{\frac{1}{2}} + ax + 9x^2 + 4$

$3x^{-2} + 2x^{-1} + 4x + 5$

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12. Write each of the following polynomials in the standard form. Also write their degree:

$x^2 + 3 + 6x + 5x^4$ (ii) $a^2 + 4 + 5a^6$ (iii)

$(x^3 - 1)(x^3 - 4)$ (iv) $(y^3 - 2)(y^3 + 11)$ (v)

$$\left(a^3 - \frac{3}{8}\right)\left(a^3 + \frac{16}{7}\right) \qquad \text{(vi)}$$

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

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13. Divide $12x^3y^3$ by $3x^2y$ (ii) $-15a^2bc^3$ by $3ab$

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14. Divide: $25x^3y^2$ by$-15x^2y$ (ii) $-72x^2yz$ by $-12xyz$

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15. Divide: $6x^3y^2z^2$ by $3x^2yz$ (2) $15m^2n^3$ by $5m^2n^2$ (3) $24a^3b^3$ by $-8ab$ (4) $-21\,abc^2$ by $7abc$

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16. Simplify: $\dfrac{16m^3y^2}{4m^2y}$ (2) $\dfrac{32m^2n^3p^2}{4mnp}$

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17. Divide: $9m^5 + 12m^4 - 6m^2$ by $3m^2$ (2)

$24x^3y + 20x^2y^2 - 4xy$ by $2xy$

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18. Divide: $6x^4yz - 3xy^3z + 8x^2yz^2yz^4$ by

$2xyz$ $\qquad \frac{2}{3}a^2b^2c^2 + \frac{4}{3}ab^2c^3 - \frac{1}{5}ab^3c^2$ b

$y \ \frac{1}{2}abc$

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19. Divide: (i)$x + 2x^2 + 3x^4 - x^5$ by $2x$, (ii)

$y^4 - 3y^3 + \dfrac{1}{2}y^2$ by $3y$

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20. Divide: $-4a^3 + 4a^2 + a$ by $2a$ `

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21. Divide: $5z^3 - 6z^2 + 7z$ by $2z$ (ii)

$\sqrt{3}\,a^4 + 2\sqrt{3}\,a^3 + 3a^2 - 6a$ by $3a$

22. Divide : $6 + x - 4x^2 + x^3$ by $x - 3$.

23. Divide: the polynomial

$2x^4 + 8x^3 + 7x^2 + 4x + 3$ by $x + 3$.

24. Divide:

$$x^3 - 6x^2 + 11x - 6 \ by \ x^2 - 4x + 3$$

25. Divide:

$$10x^4 + 17x^3 - 62x^2 + 30x - 3 \ by \ 2x^2 + 7x - 1$$

26. Using division show that $3y^2 + 5$ is factor of $6y^5 + 15y^4 + 16y^3 + 4y^2 + 10y - 35$.

27. Divide:

$3y^5 + 6y^4 + 6y^3 + 7y^2 + 8y + 9 \, by \, 3y^3 + 1$

and verify that

$divided = divisor \times quotient + remainder$

28. What must be subtracted from $8x^4 + 14x^3 - 2x^2 + 7x - 8$ so that the resulting polynomial is exactly divisible by $4x^2 + 3x - 2$.

29. Find the values of a and b so that $x^4 + x^3 + 8x^2 + ax + b$ is divisible by $x^2 + 1$.

30. Divide: $5x^3 - 15x^2 + 25x$ by $5x$

$4z^3 + 6z^2 - z$ by $-\dfrac{1}{2}z$

31. Divide: $3x^3y^2 + 2x^2y + 15xy$ by $3xy$

$x^2 + 7x + 12$ by $x + 4$

32. Divide: $3x^3 + 4x^2 + 5x + 18 \ by \ x + 2$ &

$14x^2 - 53x + 45 \ by \ 7x - 9$

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33. Divide:

$3y^4 - 3y^3 - 4y^2 - 4y^2 - 4y - by \ y^2 - 2y$

$2y^5 + 10y^4 + 6y^3 + y^2 + 5y + 3 \ by \ 2y^3 + 1$

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34. Divide:

$m^3 - 14m^2 + 37m - 26$ by $m^2 - 12m + 13$

$x^4 + x^2 + 1$ by $x^2 + x + 1$

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35. Divide each of and find the quotient and remainder: $14x^3 - 5x^2 + 9x - 1$ by $2x - 1$

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36. Divide each of and find the quotient and remainder: $6x^3 - x^2 - 10x - 3 \; by \; 2x - 3$

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37. Divide each of and find the quotient and remainder:

$6x^3 + 11x^2 - 39x - 65 \; by \; 3x^2 + 13x + 13$

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38. Divide each of and find the quotient and remainder:

$$30x^4 + 11x^3 - 82x^2 - 12x + 48 \; by \; 3x^2 + 2x - 4$$

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39. Divide the polynomial $p(x) = x^4 - 3x^2 + 4x + 5$ by the polynomial $g(x) = x^2 - x + 1$ and find quotient and remainder.

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40. Verify division algorithm i.e. Dividend = Divisor x Quotient + Remainder, in each of the following . Also write the quotient and remainder: $14x^2 + 13x - 15$ by $7x - 4$

41. Divide $15y^4 + 16y^3 + \dfrac{10}{3}y - 9y^2 - 6$ by $3y - 2$. Write down the coefficients of the terms in the quotient.

42. Using division of polynomials state whether $x + 6$ is $fac \rightarrow r$ of $x^2 - x - 42$ `

43. Find the value of a, if $x + 2$ is a factor of

$$4x^4 + 2x^3 - 3x^3 + 8x + 5a.$$

44. What must be added to $x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$.

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45. Divide $x^4 - x^3 + x^2 + 5$ by $(x + 1)$ and write the quotient and remainder.

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46. Divide:

$16x^4 + 12x^3 - 10x^2 + 8x + 20 \; by \; 4x - 3.$

Also write the quotient and remainder.

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47. Divide $12x^3 - 8x^2 - 6x + 10 \; by \; (3x - 2)$.

Also, write the quotient and the remainder.

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48. Divide $8y^3 - 6y^2 + 4y - 1$ by $4y + 2$. Also

write the quotient and the remainder.

49. Divide:

$x^3 - 6x^2 + 11x - 6$ by $x^2 - 4x + 3$

50. Divide the first polynomial by the second polynomial in each of the following. Also , write the quotient and remainder:

$3x^2 + 4x + 5, \ x - 2$ (ii)

$10x^2 - 7x + 8, \ 5x - 3$

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51. Divide the first polynomial by the second polynomial in each of the following. Also ,

write the quotient and remainder:

$x^4 - x^3 + 5x, \ x - 1$ (ii) $y^4 + y^2, \ y^2, \ - 2$

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52. Find , whether or not the first polynomial is a factor of the second: $x + 1, \ 2x^2 + 5x + 4$

$y - 2, \ 3y^3 + 5y^2 + 5y + 2$ `

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53. Find , whether or not the first polynomial is a factor of the second: $4 - z, \; 3z^2 - 13z + 4$

(ii) $2a - 3, \; 10a^2 - 9a - 5$

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54. Find , whether or not the first polynomial is a factor of the second: $4 - z, \; 3z^2 - 13z + 4$

(ii) $2a - 3, \; 10a^2 - 9a - 5$

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55. Divide: $35a^2 + 32a - 99$ by $7a - 9$

$ax^2 + (b + ac)x + bc$ by $x + c$

56. Divide $\left(a^4 - b^4\right)$ by a - b and find the quotient and remainder .

57.   Divide:

$$a^{12} + a^6 b^6 + 6^{12} \ by \ a^6 - a^3 b^3 + b^6$$

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58.   Divide:

$$x^{4a} + x^{2a} y^{2b} + y^{4b} \ by \ x^{2a} + \ x^a \, y^b + \ y^{2b}$$

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59. Divide: $x^2 - 5x + 6$ by $x - 3$ (ii)

$ax^2 - ay^2$ by $ax + ay$

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60. Divide: $x^4 - y^4$ by $x^2 - y^2$ (ii)

$acx^2 + (bc + ad)x + bd$ by $(ax + b)$

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61. Divide:

$$\left(a^2 + 2ab + b^2\right) - \left(a^2 + 2ac + c^2\right) \text{ by } 2a + b + c$$

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