MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

FACTORIZATION OF POLYNOMIAL

Others

1. Show that $(x-2)$ is a factor of the polynomial $f(x)=2x^3-3x^2-17x+30$ and hence factorize $f(x)$.

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2. What must be added to $3x^3 + x^2 - 22x + 9$ so that the result is exactly divisible by $3x^2 + 7x - 6$?

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3. If both $x - 2$ and $x - \frac{1}{2}$ are factors of $px^2 + 5x + r$, show that $p = r$.

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4. Find the values of a and b so that the polynomial $x^3 + 10x^2 + ax + b$ is exactly divisible by $x - 1$ as well as $x - 2$. .

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5. For what values of a is $2x^3 + ax^2 + 11x + a + 3$ exactly divisible by $(2x - 1)$?

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6. Determine the value of a for which the polynomial $2x^4 - ax^3 + 4x^2 + 2x + 1$ is divisible by $2x + 1$.

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7. Find the value of a and b so that the polynomial $x^3 - ax^2 - 13x + b$ has $(x - 1)$ and $(x + 3)$ as factors.

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8. Without actual division prove that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly division by $x^2 - 3x + 2$.

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9. Find the value of a, if $x - 1$ is a factor of $x^3 - a^2x + x + 2$.

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10. If the polynomials $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$, when divided by $(x - 2)$ leave the same remainder, find

the value of a .

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11. Show that $(x-1)$ is a factor of $x^{10}-1$ and also of $x^{11}-1$.

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12. Identify polynomials in the following:

(i) $f(x)=4x^3-x^2-3x+7$

(ii) $g(x)=2x^3-3x^2+\sqrt{x}-1$

(iii) $p(x)=\frac{2}{3}x^2-\frac{7}{4}x+9$

(iv) $q(x)=2x^2-3x+\frac{4}{x}+2$

(v) $h(x) = x^4 - x^{\frac{2}{3}} + x - 1$

(vi) $f(x) = 2 + \frac{3}{x} + 4x$

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13. Show that $x = 1$ is a root of the polynomial $2x^3 - 3x^2 + 7x - 6$

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14. If $x = \frac{4}{3}$ is a root of the polynomial $f(x) = 6x^3 - 11x^2 + kx - 20,$ find the value of k

A. $k = 19$

B. $k = 29$

C. $k = 9$

D. $k = 49$

Answer: A

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15. If $x = 2$ and $x = 0$ are roots of the polynomial $f(x) = 2x^3 - 5x^2 + ax + b$. Find the values of a and b.

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16. Which of the following expressions are polynomials in one variable and which are not? State reasons for your answer :

(i) $3x^2 - 4x + 15$

(ii) $y^2 + 2\sqrt{3}$

(iii) $3\sqrt{x} + \sqrt{2}x$

(iv) $x - \frac{4}{x}$

(v) $x^{12} + y^3 + t^{50}$

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17. Write the degrees of each of the following polynomials:

$7x^3 + 4x^2 - 3x + 12$ (ii) $12 - x + 2x^3$ (iii) $5y - \sqrt{2}$ (iv) 7

(v) 0

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18. Classify the following polynomials as polynomials in one-variable, two variables etc. :

(i) $x^2 - xy + 7y^2$

(ii) $x^2 - 2tx + 7t^2 - x + t$

(iii) $t^3 - 3t^2 + 4t - 5$

(iv) $xy + yz + zx$

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19. Using factor theorem, factorize the polynomial $x^3 - 6x^2 + 11x - 6.$

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20. Find the rational roots of the polynomial $2x^3 + 3x^2 - 11x - 6$

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21. If $x = 0$ and $x = -1$ are the roots of the polynomial $f(x) = 2x^3 - 3x^2 + ax + b$, find the value of a and b

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22. if f(x) = $x^4 - 2x^3 + 3x^2 - ax + b$ is a polynomial such that when it is divisible by x-1 and x+1 remainders are 5 and 19 respectively . determine remainder when it is divisible by $x - 1$.

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23. Using factor theorem, factorize the polynomial

$x^4 - 2x^3 - 13x^2 + 14x + 24$

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24. Factorize : $2x^4 + x^3 - 14x^2 - 19x - 6$

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25. Without actual division, prove that $2x^4 - 5x^3 + 2x^2 - x + 2$ is exactly divisible by $x^2 - 3x + 2$.

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26. Factorize $x^3 + 13x^2 + 32x + 20$, if it is given that $x + 2$ is its factor.

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27. If $x^2 - 1$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$, show that $a + c + e = b + d$

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

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29. Without actual division, prove that $x^4 + 2x^3 - 2x^2 + 2x - 3$ is exactly divisible by $x^2 + 2x - 3$.

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30. If is a factor of each of the following two polynomials, find the values of a in each case. $x^3 - 2ax^2 + ax - 1$

$x^5 - 3x^4 - ax^3 + 3ax^2 + 2ax + 4$

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31. If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is a polynomial such that when1 it is divided by $x - 1$ and $x + 1$, remainders are 5 and 19 respectively.

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32. Using factor theorem, factorize each of the following polynomials : $x^3 + 2x^2 - x - 2$

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33. Use factor theorem to prove that (x+a) is a factor of $(x^n + a^n)$ for any odd positive integer n .

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34. The polynomials $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$ are divided by $x + 2$, if the remainder in each case is the same, find the value of a

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35. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x - 3)$, find the value of a

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36. Find the remainder when $f(x) = x^3 - 6x^2 + 2x - 4$ is divided by $g(x) = 3x - 1$.

A. $-\frac{107}{27}$

B. $-\frac{190}{56}$

C. $-\frac{179}{79}$

D. $\frac{907}{25}$

Answer: A

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37. Find the remainder when $p(x) = 4x^2 - 2x^2 + 14x - 3$ is divided by $g(x) = x - \frac{1}{2}$

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38. Find the remainder when $p(x) = x^3 - ax^2 + 6x - a$ is divided by $(x - a)$.

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39. Find the integral roots of the polynomial $f(x) = x^3 + 6x^2 + 11x + 6$

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40. What must be subtracted from $x^3 - 6x^2 - 15x + 80$ so that the result is exactly divisible by $x^2 + x - 12$?

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41. If $x^3 + ax^2 - bx + 10$ is divisible by $x^2 - 3x + 2$, find the values of a and b.

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42. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$ so that the result is exactly divisible by $2x^2 + x - 1$

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43. If the polynomials $2x^3 + ax^2 + 3x - 5$ and $x^3 + x^2 - 4x + a$ leave the same remainder when divided by $x - 2$, find the value of a.

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44. Factorize $9z^3 - 27z^2 - 100z + 300$, if it is given that $(3z + 10)$ is a factor of it.

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45. Using factor theorem, factorize each of the following polynomials : $x^4 - 2x^3 - 7x^2 + 8x + 12$

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46. Using factor theorem, factorize each of the following polynomials : $2x^4 - 7x^3 - 13x^2 + 63x - 45$

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47. Using factor theorem, factorize each of the following polynomials : $3x^3 - x^2 - 3x + 1$

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48. Using factor theorem, factorize each of the following polynomials : $x^3 - 10x^2 - 53x - 42$

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49. Using factor theorem, factorize each of the following polynomials : $x^3 + 13x^2 + 32x + 20$

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50. Using factor theorem, factorize each of the following polynomials : $x^3 + 2x^2 - x - 2$

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51. Which of the following expressions are polynomials in one variable and which are not? State reasons for your

answer : (i) $3x^2 - 4x + 15$ (ii) $y^2 + 2\sqrt{3}$ (iii)$3\sqrt{x} + \sqrt{2}x$ (iv) $x - \frac{4}{x}$ (v) $x^{12} + y^3 + t^{50}$

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52. Which of the following expressions are polynomials in one variable and which are not? State reasons for your answer : (i) $3x^2 - 4x + 15$ (ii) $y^2 + 2\sqrt{3}$ (iii)$3\sqrt{x} + \sqrt{2}x$ (iv) $x - \frac{4}{x}$ (v) $x^{12} + y^3 + t^{50}$

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53. Which of the following expressions are polynomials in one variable and which are not? State reasons for your

answer : (i) $3x^2 - 4x + 15$ (ii) $y^2 + 2\sqrt{3}$ (iii)$3\sqrt{x} + \sqrt{2}x$ (iv) $x - \frac{4}{x}$ (v) $x^{12} + y^3 + t^{50}$

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54. Write the coefficient of x^2 in each of the following:

$17 - 2x + 7x^2$ (ii) $9 - 12x + x^3$

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55. Write the coefficient of x^2 in each of the following:

$\frac{\pi}{6}x^2 - 3x + 4$ (ii) $\sqrt{3}\,x - 7$

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56. Write the degrees of each of the following polynomials:

$7x^3 + 4x^2 - 3x + 12$ (ii) $12 - x + 2x^3$ (iii) $5y - \sqrt{2}$ (iv) 7

(v) 0

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57. Write the degrees of each of the following polynomials:

$7x^3 + 4x^2 - 3x + 12$ (ii) $12 - x + 2x^3$ (iii) $5y - \sqrt{2}$ (iv) 7

(v) 0

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58. Classify the following polynomials as linear, quadratic, cubic and biquadratic polynomials: $x + x^2 + 4$ (ii)$3x - 2$

(iii) $2x + x^2$

(i), $x + x^2 + 4$, it is quadratic polynomial.

(ii)$3x - 2$,It is a linear polynomial.

(iii)$2x + x^2$,It is a linear polynomial.

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59. Classify the following polynomials as linear, quadratic, cubic and biquadratic polynomials: $3y$ (ii) $t^2 + 1$ (iii) $7t^4 + 4t^3 + 3t - 2$

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60. Classify the following polynomials as polynomials in one-variable, two variables etc.: $x^2 - xy + 7y^2$ (ii) $x^2 - 2tx + 7t^2 - x + t$

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61. Classify the following polynomials as polynomials in one-variable, two variables etc.: $t^3 - 3t^2 + 4t - 5$ (ii) $xy + zy + zx$

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62. Identify polynomials in the following:

$f(x) = 4x^3 - x^2 - 3x + 7$ $g(x) = 2x^3 - 3x^2 + \sqrt{x} - 1$

$p(x) = \frac{2}{3}x^2 - \frac{7}{4}x + 9$ $q(x) = 2x^2 - 3x + \frac{4}{x} + 2$

$h(x) = x^4 - x^{\frac{2}{3}} + x - 1$ $f(x) = 2 + \frac{3}{x} + 4x$

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63. Identify polynomials in the following:

$f(x) = 4x^3 - x^2 - 3x + 7$ $g(x) = 2x^3 - 3x^2 + \sqrt{x} - 1$

$p(x) = \frac{2}{3}x^2 - \frac{7}{4}x + 9$ $q(x) = 2x^2 - 3x + \frac{4}{x} + 2$

$h(x) = x^4 - x^{\frac{2}{3}} + x - 1$ $f(x) = 2 + \frac{3}{x} + 4x$

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64. Identify polynomials in the following:

$f(x) = 4x^3 - x^2 - 3x + 7$ $g(x) = 2x^3 - 3x^2 + \sqrt{x} - 1$

$p(x) = \frac{2}{3}x^2 - \frac{7}{4}x + 9$ $q(x) = 2x^2 - 3x + \frac{4}{x} + 2$

$h(x) = x^4 - x^{\frac{2}{3}} + x - 1$

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65. Identify constant, linear, quadratic and cubic polynomials from the following polynomials: $f(x) = 0$ (ii) $g(x) = 2x^3 - 7x + 4$

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66. Identify constant, linear, quadratic and cubic polynomials from the following polynomials: $h(x) = -3x + \frac{1}{2}$ (ii) $p(x) = 2x^2 - x + 4$

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67. Identify constant, linear, quadratic and cubic polynomials from the following polynomials:

$q(x) = 4x + 3$ (ii) $r(x) = 3x^3 + 4x^2 + 5x - 7$

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68. Give one example each of a binomial of degree 35 and of a monomial of degree 100.

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69. If $f(x) = 2x^3 - 13x^2 + 17x + 12,$ find $f(2)$ (ii) $f(-3)$

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70. Show that $x = 1$ is a root of the polynomial $2x^3 - 3x^2 + 7x - 6$

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71. If $x = \frac{4}{3}$ is a root of the polynomial $f(x) = 6x^3 - 11x^2 + kx - 20$, find the value of k

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72. If $x = 2$ and $x = 0$ are roots of the polynomial $f(x) = 2x^3 - 5x^2 + az + b$. Find the values of a and b.

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73. Find the integral roots of the polynomial $f(x) = x^3 - 6x^2 + 11x - 6$

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74. Find the rational roots of the polynomial $2x^3 + 3x^2 - 11x - 6$

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75. Find the zero (root) of the polynomial in each of the following cases: $f(x) = x - 5$ (ii) $g(x) = 2x + 5$

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76. Find the zero (root) of the polynomial in each of the following cases: (i)$h(x) = 2x$ (ii) $p(x) = c\,x + d,\ \neq 0$ (iii)$p(x) = ax,\ a\ \neq 0$

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77. यदि $f(x) = 2x^3 - 13x^2 + 17x + 12$ हो, तो $(i)\quad f(2)(ii)\quad f(-3)(iii)\quad f(0)$ ज्ञात कीजिए।

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78. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases: $f(x) = 3x + 1,\ x = -\frac{1}{3}$

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79. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases:

$f(x) = x^2 - 1,\ x = 1,\ -1$

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80. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases:

$g(x) = 3x^2 - 2,\ x = \frac{2}{\sqrt{3}},\ -\frac{2}{\sqrt{3}}$

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81. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases:

$p(x) = x^3 - 6x^2 + 11x - 6,\ x = 1,\ 2,\ 3$

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82. Verify whether the following are zeroes of the polynomial, indicated against them. (i) $p(x) = 3x + 1, x = -\frac{1}{3}$ (ii) $p(x) = 5x - \pi, x = \frac{4}{5}$ (iii) $p(x) = x^2 - 1, x = 1, -1$ (iv) $p(x) = (x + 1)(x + 2), x = -1, 2$ (v) $p(x) = x^2, x = 0$ (vi) $p(x) = lx + m, x = -\frac{m}{l}$ (vii)

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83. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases: $f(x) = x^2,\ x = 0$

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84. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases:

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85. Verify whether the indicated numbers are zeros of the polynomials corresponding to them in that cases: $f(x) = 2x + 1,\ x = \frac{1}{2}$

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86. If $x = 2$ is a root of the polynomial $f(x) = 2x^2 - 3x + 7a,$ find the value of a if $x = 2, f(x) = 0$

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87. If $x = -\frac{1}{2}$ is a zero of the polynomial $p(x) = 8x^3 - ax^2 - x + 2,$ find the value of a

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88. If $x = 0$ and $x = -1$ are the roots of the polynomial $f(x) = 2x^3 - 3x^2 + ax + b$, find the value of a and b

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89. Find the integral roots of the polynomial $f(x) = x^3 - 6x^2 + 11x - 6$

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90. Find rational roots of the polynomial $f(x) = 2x^3 + x^2 - 7x - 6$

Clearly f(x) is a cubic polynomial with integer coefficient.

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91. Let $p(x) = x^4 - 3x^2 + 2x + 5$. Find the remainder when $p(x)$ is divided by $(x - 1)$.

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92. Find the remainder when $p(y) = y^3 + y^2 + 2y + 3$ is divided by $y + 2$.

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93. Find the reminder when, $p(x) = x^4 - 3x^2 + 2x + 1$,is divided by $(x - 1)$

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94. Find the remainder when $p(x) = x^3 - ax^2 + 6x - a$ is divided by $(x - a)$.

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95. Find the remainder when the polynomial f $f(x) = 2x^4 - 6x^3 + 2x^2 - x + 2$ is divided by $x + 2$ divisor

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96. Find the remainder when $p(x) = 4x^3 - 12x^2 + 14x - 3$ is divided by

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

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97. Find the remainder when $f(x) = x^3 - 6x^2 + 2x - 4$ is divided by $g(x) = 3x - 1$.

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98. Find the remainder when $f(x) = x^3 - 6x^2 + 2x - 4$ is divided by $g(x) = 3x - 1$.

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99. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by $(x - 3)$, find the value of a.

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100. The polynomials $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$ are divided by $x + 2$, if the remainder in each case is the same, find the value of a.

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101. Let R_1 and R_2 are the remainders when the polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$

are divided by $x+1$ and $x-2$ respecti-vely. If $2R_1 + R_2 = 6$, find the value of a.

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102. If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is a polynomial such that when it is divided by $x-1$ and $x+1$, the remainders are respectively 5 and 19. Determine the remainder when $f(x)$ is divided by $(x-2)$.

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103. $f(x) = x^3 + 4x^2 - 3x + 10,\ g(x) = x + 4$

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104. बहुपद f (x) को बहुपद g (x) से विभाजित करने पर शेषफल प्रमेय की सहायता से शेषफल ज्ञात कीजिए तथा परिणाम की पुष्टि वास्तविक भोजन द्वारा भी कीजिए।

$f(x) = 4x^4 - 3x^3 - 2x^2 + x - 7, g(x) = x - 1$

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105. $f(x) = 4x^3 - 12x^2 + 14x - 3,\ g(x) = 2x - 1$

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106. $f(x) = x^3 - 6x^2 + 2x - 4,\ g(x) = 1 - 2x$

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107. Find the remainder when $f(x) = x^4 - 3x^2 + 4$ is divided by $g(x) = x - 2$ is.

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108. $f(x) = 9x^3 - 3x^2 + x - 5, g(x) = x - \frac{2}{3}$

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109. $f(x) = 3x^4 + 2x^3 - \frac{x^2}{3} - \frac{x}{9} + \frac{2}{27}, g(x) = x + \frac{2}{3}$

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110. If the polynomials $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$, when divided by $(x - 2)$ leave the same remainder, find the value of a .

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111. The polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ when divided by $(x - 4)$ leave the remainders $R_1 and R_2$ respectively. Find the values of a in each of the following cases, if $R_1 = R_2$ (ii) $R_1 + R_2 = 0\ 2R_1 - R_2 = 0$

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112. If the polynomials $ax^3 + 3x^2 - 13$ and $2x^3 - 5x + a$, when divided by $(x - 2)$ leave the same remainder, find the value of a

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113. Find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by (i) $x + 1$ (ii) $x - \frac{1}{2}$ (iii) x (iv) $x + \pi$ (v) $5 + 2x$

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114. Find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by (i) $x + 1$ (ii) $x - \frac{1}{2}$ (iii) x (iv) $x + \pi$ (v) $5 + 2x$

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115. Show that $(x-3)$ is a factor of the polynomial $x^3-3x^2+4x-12$

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116. Show that $(x-1)$ is a factor of $x^{10}-1$ and also of $x^{11}-1$.

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117. Show that $x+1$ and $2x-3$ are factors of $2x^3-9x^2+x+12$

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118. Without actual division prove that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly divisible by $x^2 - 3x + 2$ is

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119. Find the value of a, if $x - a$ is a factor of $x^3 - a^2x + x + 2$

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120. Find the value of k, if $x + 3$ is a factor of $3x^2 + kx + 6$.

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121. Determine the value of a for which the polynomial $2x^4 - ax^3 + 4x^2 + 2x + 1$ is divisible by $1 - 2x$.

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122. Find the value of a and b so that the polynomial $x^3 - ax^2 - 13x + b$ has $(x - 1)$ and $(x + 3)$ as factors.

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123. Find the values of a and b so that the polynomial $x^3 + 10x^2 + ax + b$ is exactly divisible by $x - 1$ as well as

$x - 2$.

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124. For what values of a is $2x^3 + ax^2 + 11x + a + 3$ exactly divisible by $(2x - 1)$?

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125. If $ax^3 + bx^2 + x - 6$ has $x + 2$ as a factor and leaves a remainder 4 when divided by $(x - 2)$, find the value of a and b.

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126. If both $x-2$ and $x-\frac{1}{2}$ are factors of px^2+5x+r, show that $p=r$.

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127. If x^2-1 is a factor of $ax^4+bx^3+cx^2+dx+e$, show that $a+c+e=b+d$

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128. Without actual division, prove that $2x^4-5x^3+2x^2-x+2$ is exactly divisible by x^2-3x+2.

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129. Without actual division, prove that $x^4 + 2x^3 - 2x^2 + 2x - 3$ is exactly divisible by $x^2 + 2x - 3$.

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130. In each of the following polynomials, find the value of a if $x + a$ is a factor: $x^3 + ax^2 - 2x + a + 4$

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131. In each of the following polynomials, find the value of a if $x + a$ is a factor: $x^4 - a^2x^2 + 3x - a$

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132. Use factor theorem to verify that $x + a$ is a factor of $x^n + a^n$ for any odd positive integer.

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133. If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is a polynomial such that when it is divided by $x - 1$ and $x + 1$, the remainders are respectively 5 and 19. Determine the remainder when $f(x)$ is divided by $(x - 2)$.

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134. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$ so that the result is exactly divisible by $2x^2 + x - 1$

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

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136. $f(x) = x^3 - 6x^2 + 11x - 6; g(x) = x - 3$

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137. $f(x) = 3x^4 + 17x^3 + 9x^2 - 7x - 10; g(x) = x + 5$

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138. check whether g(x) is a factor of f(x) or not f(x)= $x^5 + 3x^4 - x^3 - 3x^2 + 5x + 15$, g(x)=$x + 3$

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139. $f(x) = x^3 - 6x^2 - 19x + 84,\ g(x) = x - 7$

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140. $f(x) = 3x^3 + x^2 - 20x + 12,\ g(x) = 3x - 2$

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141. Using the remainder theorem, find out whether g(x) is factor of f(x) or not?

$f(x) = 2x^3 - 9x^2 + x + 12,\ g(x) = 3 - 2x$

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142. $f(x) = x^3 - 6x^2 + 11x - 6,\ g(x) = x^2 - 3x + 2$

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143. Show that $(x - 2), (x + 3)$ and $(x - 4)$ are factors of $x^3 - 3x^2 - 10x + 24.$

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144. Show that $(x+4),\ (x-3) and\ (x-7)$ are factors of $x^3-6x^2-19x+84$

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145. For what value of a is $(x-5)$ a factor of $x^3-3x^2+ax-10$?

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146. Find the value of a such that $(x-4)$ is a factor of $5x^3-7x^2-ax-28$

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147. Find the value of a, if $x+2$ is a factor of $4x^4+2x^3-3x^2+8x+5a$

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148. Find the value of k if $x-3$ is a factor of $k^2x^3-kx^2+3kx-k$

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149. Find the values of a and b, if x^2-4 is a factor of $ax^4+2x^3-3x^2+bx-4.$

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150. Find $\alpha \, and \, \beta$, if $x+1 \, and \, x+2$ are factors of $x^3+3x^2-2\alpha x+\beta$

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151. Find the values of $p \, and \, q$ so that $x^4+px^3+2x^2-3x+q$ is divisible by $\left(x^2-1\right)$

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152. Find the values of $a \, and \, b$ so that $(x+1) and \, (x-1)$ are factors of $x^4+ax^3-3x^2+2x+b$

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153. If $x^3 + ax^2 - bx + 10$ is divisible by $x^2 - 3x + 2$, find the values of a and b

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154. if $(x + 1)$ and $(x - 1)$ are factors of $p(x) = ax^3 + x^2 - 2x + b$ find the values of $a\&b$

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155. What must be added to $x^3 - 3x^2 - 12x + 19$ so that the result is exactly divisibly by $x^2 + x - 6$?

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156. What must be subtracted from $x^3 - 6x^2 - 15x + 80$ so that the result is exactly divisible by $x^2 + x - 12$?

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157. What must be added to $3x^3 + x^2 - 22x + 9$ so that the result is exactly divisible by $3x^2 + 7x - 6$?

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158. If $x - 2$ is a factor of each of the following two polynomials, find the values of a in each case. (i)

$x^3 - 2ax^2 + ax - 1$ (ii)

$x^5 - 3x^4 - ax^3 + 3ax^2 + 2ax + 4$

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159. In each of the following two polynomials, find the value of a, if $x - a$ is a factor: (i)

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

$x^5 - a^2x^3 + 2x + a + 1$

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160. In each of the following two polynomials, find the value of a, if $x + a$ is a factor. (i) $x^3 + ax^2 - 2x + a + 4$ (ii)$x^4 - a^2x^2 + 3x - a$

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161. Show that $(x-2)$ is a factor of the polynomial $f(x)=2x^3-3x^2-17x+30$ and hence factorize $f(x)$.

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162. Using factor theorem, factorize the polynomial $x^3-6x^2+11x-6$.

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163. Using factor theorem, factorize the polynomial $x^4+x^3-7x^2-x+6$

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164. Using factor theorem, factorize the polynomial $x^4 - 2x^3 - 13x^2 + 14x + 24$

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165. Factorize : $2x^4 + x^3 - 14x^2 - 19x - 6$

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166. Factorize $x^3 + 13x^2 + 32x + 20$, if it is given that $x + 2$ is its factor.

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167. Factorize $9z^3 - 27z^2 - 100z + 300$, if it is given that $(3z + 10)$ is a factor of it.

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168. using factor theorm factorize the following $x^3 + 6x^2 + 11x + 6$

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169. Using factor theorem, factorize each of the following polynomials : $x^3 + 2x^2 - x - 2$

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170. using factor theorm factorize the following $x^3 - 6x^2 + 3x + 10$

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171. Using factor theorem, factorize each of the following polynomials : $x^4 - 2x^3 - 7x^2 + 8x + 12$

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172. Using factor theorem, factorize each of the following polynomials : $x^4 - 2x^3 - 7x^2 + 8x + 12$

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173. Using factor theorem, factorize the following polynomial : $x^4 + 10x^3 + 35x^2 + 50x + 24$ Let $f(x) = x^4 + 10x^3 + 35x^2 + 50x + 24$

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174. Using factor theorem, factorize each of the following polynomials : $2x^4 - 7x^3 - 13x^2 + 63x - 45$

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175. Using factor theorem, factorize each of the following polynomials : $3x^3 - x^2 - 3x + 1$

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176. Factorise $x^3 - 23x^2 + 142x - 120$

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177. Using factor theorem, factorize the following polynomial : $y^3 - 7y + 6$

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178. Using factor theorem, factorize each of the following polynomials : $x^3 - 10x^2 - 53x - 42$

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179. using factor theorm factorize the following $y^3 - 2y^2 - 29y - 42$

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180. Using factor theorem, factorize each of the following polynomials : $x^3 - 10x^2 - 53x - 42$

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181. Favtorise$x^3 + 13x^2 + 32x + 20$

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182. Factorise: (i) $x^3 - 2x^2 - x + 2$ (ii)$x^3 - 3x^2 - 9x - 5$

(iii)$x^3 + 13x^2 + 32x + 20$ (iv) $2y^3 + y^2 - 2y - 1$

$x^3 + 2x^2 - x - 2$

$= x\left(x^2-1\right)-2\left(x^2-1\right)$

$x^3-2x^2-x+2 = \left(x^2-1\right)(x-2)$

Using the identity:$a^2 - b^2 = (a + b)(a - b)$

$\therefore \left(x^2-1\right) = (x + 1)(x-1)$

$= (x-1)(x + 1)(x - 2)$

ii)$x^3 - 3x^2 - 9x - 5$

$x\left(x^2 + 2x + 1\right) - 5\left(\left(x^2 + 2x + 1\right)\right.$

$(x - 5)\left(x^2 + 2x + 1\right)$

The value of $x^3 + 13x^2 + 32x + 20 is \left(x^3 + x^2 + 12x^2 + 12x + 20x + 20\right)$

$\Rightarrow x^2(x + 1) + 12x(x + 1) + 20(x + 1)$

$\Rightarrow (x - 1)\left(x^2 + 12x + 20\right)$

$\Rightarrow (x-1)\left(x^2+10x+2x+20\right)$

$\Rightarrow (x+1)(x(x+10)+2(x+10))$

$\Rightarrow (x+1)(x+2)(x+10)$

iv)Now Factorizing,$2y^3+y^2-2y-1$

$=y^2(2y+1)-1(2y+1)$

$=(2y+1)\left(y^2-1\right)$

$=(2y+1)\left(y^2-1^2\right)$

$\left(y^2-1^2\right)=(y+1)(y-1)$

$(2y+1)\left(y^2-1^2\right)$

$(2y+1)(y+1)(y-1)$

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183. Factorize :$2y^3+y^2-2y-1$

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184. Factorize :$x^3 - 2x^2 - x + 2$

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185. Factorize : $x^3 + 13x^2 + 31x - 45$ given that $x + 9$ is a factor

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186. Factorize: $4x^3 + 20x^2 + 33x + 18$ given that $2x + 3$ is a factor

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187. Zero of a Polynomial

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188. If $x = \frac{1}{2}$ is a zero of the polynomial $f(x) = 8x^3 + ax^2 - 4x + 2$, find the value of a

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189. Write the remainder when the polynomial $f(x) = x^3 + x^2 - 3x + 2$ is a divided by $x + 1$

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190. Find the remainder when $x^3 + 4x^2 + 4x - 3$ is divided by x

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191. If $x + 1$ is a factor of $x^3 + a,$ then write the value of a

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192. If $f(x) = x^4 - 2x^3 + 3x^2 - ax - b$ when divided by $x - 1$, the remainder is $6,$ then find the value of $a + b$

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193. If $x - 2$ is a factor of $x^2 + 3ax - 2a,$ then $a =$ 2 (b) -2 (c) 1 (d) -1

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194. If $x^3 + 6x^2 + 4x + k$, is exactly divisible by $(x + 2),$ then the value of k is:

$x + 2 = 0, x = -2$

$(-2)^3 + 6(-2)^2 + 4(-2) + k = 0$

$-8 + 24 - 8 + k = 0$

$8 + k = 0$

$k = -8$

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195. If $x - a$ is a factor of $x^3 - 3x^2a + 2a^2x + b,$ then the value of b is 0 (b) 2 (c) 1 (d) 3

$x - a = 0, x = a$

$a^3 - 3a^2(a) + 2a^2(a) + b = 0$

$-3a^3 + 3a^3 + b = 0$

$b = 0$

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196. If $x^{140} + 2x^{151} + k$ is divisible by $x + 1$, then the value of k is=? (a)1 (b) -3 (c) 2 (d) -2

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197. If $x+2$ and $x-1$ are the factors of x^3+10x^2+mx+n, then the values of m and n are respectively=? (a)5 and -3 (b) 17 and -8 7 and -18 (d) 23 and -19

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198. Let $f(x)$ be a polynomial such that $f\left(-\frac{1}{2}\right)=0$, then a factor of $f(x)$ is:? (a)$2x-1$ (b) $2x+1$ (c)$x-1$ (d) $x+1$

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199. When x^3-2x^2+ax-b is divided by x^2-2x-3, the remainder is $x-6$. The values of a and b are

respectively.

(a) $-2, \ -6$

(b) $2, \ -6$

(c) $-2, 6$

(d) $2, 6$

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200. One factor of $x^4 + x^2 - 20$ is $x^2 + 5$. The other factor is $x^2 - 4$ (b) $x - 4$ (c) $x^2 - 5$ (d) $x + 2$

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201. If $(x - 1)$ is a factor of polynomial $f(x)$ but not of $g(x)$, then it must be a factor of (a) $f(x)g(x)$ (b)

$-f(x)+g(x)$ (c) $f(x)-g(x)$ (d) $\{f(x)+g(x)\}g(x)$

if (x -1) is a factor of polynomial f(x) but not of g(x)

Then it must be a factor of multiplication of f(x) and g(x).

i.e $f(x)g(x)$

.Option A is correct.

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202. (x+1) is a factor of x^n+1 only if (a)n is an odd integer

(b) n is an even integer (c)n is a negative integer (d)n is a positive integer

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203. If $x+2$ is a factor of $x^2+mx+14$, then $m=$ (a)7

(b) 2 (c) 9 (d) 14

$x+2=0, x=-2$

$(-2)^2+m(-2)+14=0$

$4-2m+14=0$

$2m=18$

$m=9$ Hence c , is correct option.

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204. If $x-3$ is a factor of $x^2-ax-15$, then $a=$

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205. If $x^2 + x + 1$ is a factor of the polynomial $3x^3 + 8x^2 + 8x + 3 + 5k$, then the value of k is 0 (b) $\frac{2}{5}$ (c) $\frac{5}{2}$ (d) -1

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206. If $(3x - 1)^7 = a_7x^7 + a_6x^6 + a_5x^5 + ... + a_1x + a_0$ then the value of $a_7 + a_6 . . . . . a_0$

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207. If $x^{51} + 51$ is divided by $x + 1$, the remainder is 0 (b) 1 (c) 49 (d) 50

If $x^{51} + 51$ is divided by $x + 1$,the remainder is 0.

$x + 1 = 0, x = -1$

$(-1)^{51} + 51$

50 is correct answer.

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208. If $x + a$ is a factor of $x^4 - a^2x^2 + 3x - 6a$, then

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

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209. Find the value of k, if $x - 1$ is a factor of

$4x^3 + 3x^2 - 4x + k$

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210. If both $x-2$ and $x-\frac{1}{2}$ are factors of px^2+5x+r, show that $p=r$.

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211. If x^2-1 is a factor of $ax^4+bx^3+cx^2+dx+e$, show that $a+c+e=b+d$

Given ,x^2-1 is a factor of $ax^4+bx^3+cx^2+dx+e$

$(x-1)(x+1)$ divides $ax^4+bx^3+cx^2+dx+e$

$When, x=1, a+b+c+d+e=0(i)$

$When, x=-1, thena-b+c-d+e=0$(ii

$a+c+e=b+d$

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