

POLYNOMIAL DIVISION HOMEWORK

Answer the questions, showing all work, on a separate page

1) Find the quotient and remainder, then write the division statement for each polynomial division.

a) $(x^3 + 13x^2 + 39x + 20) \div (x + 9)$

f) $(x^3 - 10x - 15 + 7x^2) \div (x + 8)$

b) $(x^3 - x^2 + 8x + 37) \div (x - 2)$

g) $(4n^3 - 13n - 6) \div (2n + 1)$

c) $(5x^3 + 3x^2 - 5x + 3) \div (x - 1)$

h) $(x^3 + 5x^2 - 2x - 24) \div (x^2 + 7x + 12)$

d) $(-2a^3 - 11a^2 + 7a + 6) \div (a + 6)$

i) $(10a^4 - a^3 + 11a^2 + 7a + 5) \div (5a^2 + 2a - 1)$

e) $(x^3 - 12x - 20) \div (x + 2)$

j) $(6t^4 + 4t^3 - 13t^2 - 10t - 5) \div (2t^2 - 5)$

2) One factor of $4x^3 + 15x^2 - 31x - 30$ is $x - 2$. Completely factor $4x^3 + 15x^2 - 31x - 30$.

3) Two factors of $12a^4 - 39a^2 + 8a - 8a^3 + 12$ are $a - 2$ and $2a + 1$. Find the other factors.

4) When $10x^3 + mx^2 - x + 10$ is divided by $5x - 3$, the quotient is $2x^2 + nx - 2$ and the remainder is 4. Find the values for m and n .

ANSWERS

1) a) $x^3 + 13x^2 + 39x + 20 = (x + 9)(x^2 + 4x + 3) - 7$ f) $x^3 + 7x^2 - 10x - 15 = (x + 8)(x^2 - x - 2) + 1$

b) $x^3 - x^2 + 8x + 37 = (x - 2)(x^2 + x + 10) + 57$ g) $4n^3 - 13n - 6 = (2n + 1)(2n^2 - n - 6)$

c) $5x^3 + 3x^2 - 5x + 3 = (x - 1)(5x^2 + 8x + 3) + 6$ h) $x^3 + 5x^2 - 2x - 24 = (x^2 + 7x + 12)(x - 2)$

d) $-2a^3 - 11a^2 + 7a + 6 = (a + 6)(-2a^2 + a + 1)$ i) $10a^4 - a^3 + 11a^2 + 7a + 5$
 $= (5a^2 + 2a - 1)(2a^2 - a + 3) + 8$

e) $x^3 - 12x - 20 = (x + 2)(x^2 - 2x - 8) - 4$ j) $6t^4 - 4t^3 - 13t^2 - 10t - 5$
 $= (2t^2 - 5)(3t^2 + 2t + 1)$

2) $4x^3 + 15x^2 - 31x - 30 = (x - 2)(4x + 3)(x + 5)$

3) other factors are $3a - 2$ and $2a + 3$

4) $m = -21, n = -3$