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

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

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

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

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

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

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

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

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

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

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) $x^3+13x^2+39x+20=(x+9)(x^2+4x+3)-7$

b) $x^3-x^2+8x+37=(x-2)(x^2+x+10)+57$

c) $5x^3+3x^2-5x+3=(x-1)(5x^2+8x+3)+6$

d) $-2a^3-11a^2+7a+6=(a+6)(-2a^2+a+1)$

e) $x^3-12x-20=(x+2)(x^2-2x-8)-4$

f) $x^3+7x^2-10x-15=(x+8)(x^2-x-2)+1$

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

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

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

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