Math 3 Name:_____

Unit 3 Day 6 CW Date:_____

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

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

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

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

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

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

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

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.**

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** $2a+3$