Math 3 **NONCALCULATOR!** Name: _____

Wkst 6.5 - Graphing Polynomials long division method.

I. Write as a product of linear factors. A zero is provided. Then, Sketch the following polynomials on the axis provided.

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

Zeros $x=0,0,-1,2$

$x^2(-x^2+x+2)$

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

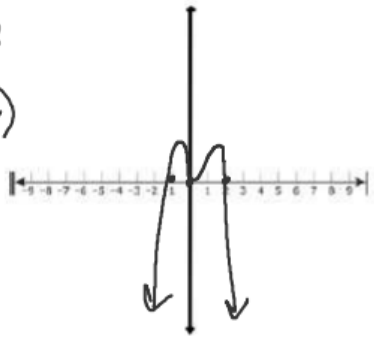
$-1 \mid -1 \quad 1 \quad 2$

$\quad\quad\quad 1 \quad -2$

$\quad -1 \quad 2 \quad 0$

$-x+2=0$

$x=2$



2) $g(x)=x^3+5x^2+2x-8$, -2

$g(x)=x^3+5x^2+2x-8$ Zero $x=-2$

$-2 \mid 1 \quad 5 \quad 2 \quad -8$

$\quad\quad -2 \quad -6 \quad 8$

$\quad 1 \quad 3 \quad -4 \quad 0$

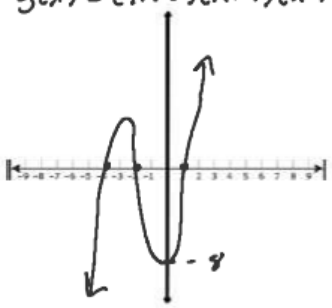
$x^2+3x-4=0$

$(x+4)(x-1)$

$x=-4 \quad x=1$

Zeros $x=-2,-4,1$

$g(x)=(x+2)(x+4)(x-1)$



4) $p(x)=-x^4+8x^3+3x^2-130x+200$, 5 is double root

$5 \mid -1 \quad 8 \quad 3 \quad -130 \quad 200$

$\quad\quad -5 \quad 15 \quad 90 \quad -200$

$5 \mid -1 \quad 3 \quad 18 \quad -40 \quad 0$

$\quad\quad -5 \quad -10 \quad 40$

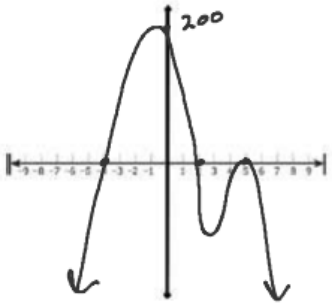
$\quad -1 \quad -2 \quad 8 \quad 0$

$-x^2-2x+8=0$

$x^2+2x-8=0$

$(x+4)(x-2)$

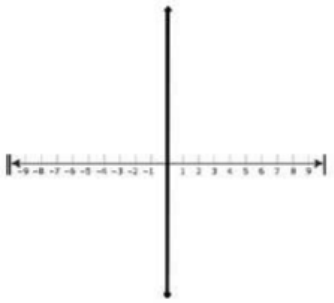
$x=-4 \quad x=2$



Zeros $x=5,5,-4,2$

$p(x)=(x-5)^2(x+4)(x-2)$

5) $j(x) = -2x^5 + 18x^4 - 5x^3 + 36x^2 + 5x - 54$, 3 has multiplicity of 3



6) $f(x) = 2x^4 - 6x^3 - 30x^2 + 38x + 60$, 2 and 5 are zeros

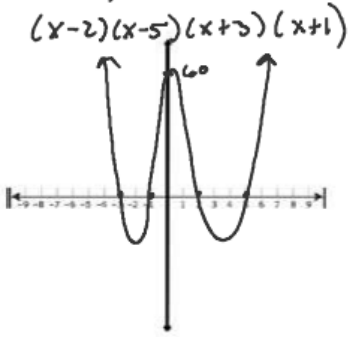
2	2	−6	−30	38	60
		4	−4	−68	−60
5	2	−2	−34	−30	0
		10	40	30	
	2	8	6	0	

$2x^2 + 8x + 6 = 0$

$x^2 + 4x + 3 = 0$ $(x+3)(x+1)$

Zeros: $2, 5, -3, -1$

$(x-2)(x-5)(x+3)(x+1)$



6) $f(x) = -x^5 + 6x^4 + x^3 - 54x^2 + 72x$, $x^2 - 9$ is a factor

$f(x) = x(-x^4 + 6x^3 + x^2 - 54x + 72)$

3	−1	6	1	−54	72
		−3	9	30	−72
−3	−1	3	10	−24	0
		3	−18	24	
	−1	6	−8	0	

$-x^2 + 6x - 8 = 0$

$x^2 - 6x + 8 = 0$

$(x-4)(x-2) = 0$

$x = 4 \quad x = 2$

Zeros $x = 0, 3, -3, 4, 2$

$x(x-3)(x+3)(x-4)(x-2)$