Chapter 2 Test Review Part A
Non-Graphing Calculator
Precalculus

Name: _____
Period: _____ Date: _____

Show all of your work and answer each question completely.

1. Given the function $f(x) = 3x^2 - 6x + 2$;

$x = \frac{-b}{2a}$ $\frac{6}{2(3)} = 1$

a) Find the vertex. $f(1) = 3 - 6 + 2 = -1$ 1a. (1, -1)

b) Find the equation of the axis of symmetry. 1b. $x = 1$

c) Does the graph open up or down? 1c. up

d) Does the graph have a minimum or maximum point? 1d. minimum

2. Determine the remainder when $x^{89} - 5x^{12} + x^3 - 7$ is divided by $x + 1$.

Divide by $(x - -1)$

Remainder Theorem

Remainder = $f(-1)$

$(-1)^{89} - 5(-1)^{12} + (-1)^3 - 7$

$-1 - 5 - 1 - 7 = -14$

2. -14

3. Given $g(x) = \frac{x + 2}{x^2 + 7x + 6}$ find:

a) the x-intercept(s) $b = 0$ -2

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

b) the y-intercept(s) $\frac{1}{3}$

$x = 0$ $\frac{2}{6}$

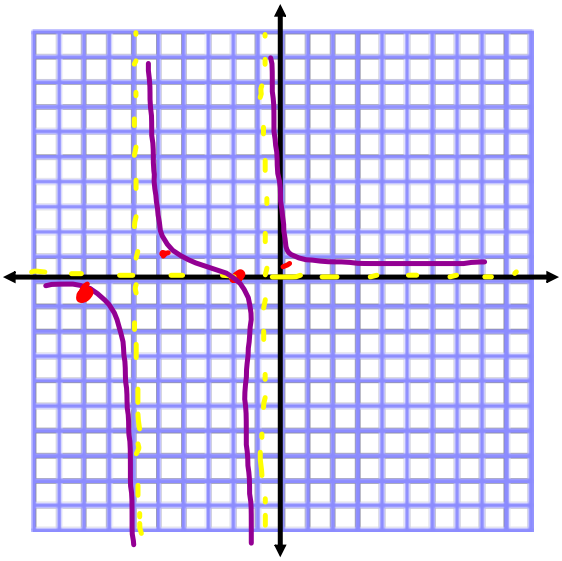
c) equation(s) of vertical asymptote(s) $x = -6$ $x = -1$

$(x + 6)(x + 1) = 0$ $x = -6$ $x = -1$

d) equation(s) of horizontal asymptote(s) _____

$y = 0$

e) equation(s) of oblique asymptote(s) none



f) Find 4 additional graph points and sketch the function.

x	-5	-8		
y	$\frac{3}{4}$	$-\frac{6}{14}$		

$\frac{-5+2}{25-35+6} = \frac{-3}{-4} = \frac{3}{4}$

4. For the polynomial function $f(x) = -2(x + 3)^3(x + 1)(x - 7)^2$, find the following, then sketch the function.

a) use limit notation to describe the end behavior

$\lim_{x \to -\infty} = -\infty$ $\lim_{x \to \infty} = -\infty$

b) list zeros and state their multiplicity

z: -3 -1 7

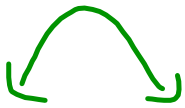
m: 3 1 2

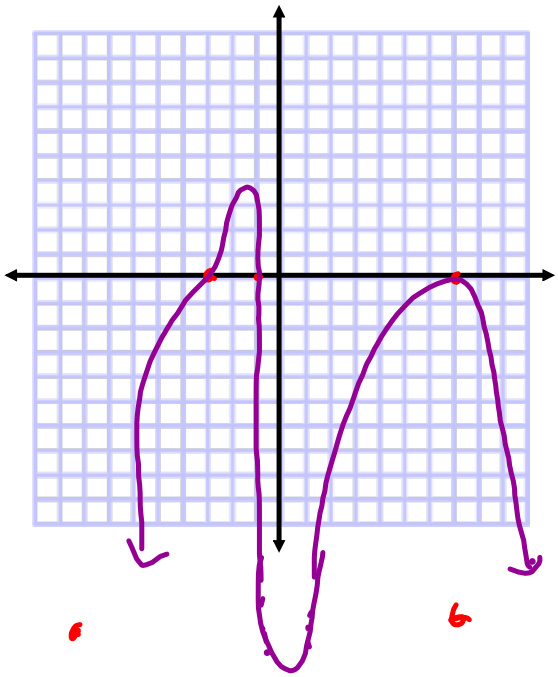
c) the y-intercept -2646

$x=0$ $-2(3)^3(1)(-7)^2$

d) the maximum number of turning points 5

e) the degree 6





5. Use long division to find the quotient and remainder:

$x^4 - 3x^3 + 6x^2 - 3x + 5$ divided by $x^2 + 1$

$x^2 - 3x + 5$

$x^2 + 1 \overline{)x^4 - 3x^3 + 6x^2 - 3x + 5}$

$x^4 \quad x^2$

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

$-3x^3 \quad -3x$

$5x^2 + 5$

$5x^2 + 5$

5. q(x) = $x^2 - 3x + 5$

r(x) = 0

6. Determine if x -3 is a factor of $f(x) = -3x^3 + 5x^2 - 10x - 7$.

Show your work and explain your reasoning below.

$f(3) = -3(3)^3 + 5(3)^2 - 10(3) - 7 = -73$

no $f(3) \neq 0$.

3| -3 5 -10 | -7

-73 Remainder $\neq 0$