Math 151 Sec F08N04 - Quiz 2 Name: SOLUTIONS
Sep 19 2008 Stu#:

(1) [**8 points**] Use long division to find the quotient and remainder when $5x^4 - 3x^2 + x + 1$ is divided by $x^2 + 2$. Clearly (and neatly) show all steps.

$$\begin{array}{r|l} & 5x^2 - 13 \\ \hline x^2 + 0x + 2 & 5x^4 + 0x^3 - 3x^2 + x + 1 \\ & -(5x^4 + 0x^3 + 10x^2) \\ \hline & \qquad\qquad -13x^2 + x + 1 \\ & \qquad\qquad -(-13x^2 + 0x - 26) \\ \hline & \qquad\qquad\qquad x + 27 \end{array}$$

$\therefore$ quotient is $5x^2 - 13$

remainder is $x + 27$

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(2) [**4 points**] Use synthetic division to find the quotient and remainder when $x^5 - 4x^3 + x$ is divided by $x + 3$.

$$
\begin{array}{r|rrrrrr}
-3 & 1 & 0 & -4 & 0 & 1 & 0 \\
 & & -3 & 9 & -15 & 45 & -138 \\
\hline
 & 1 & -3 & 5 & -15 & 46 & \boxed{-138}
\end{array}
$$

$\therefore$ quotient is $x^4 - 3x^3 + 5x^2 - 15x + 46$

remainder is -138

(3) [**3 points**] Use synthetic division to determine if $x - 2$ is a factor of $3x^4 - 6x^3 - 5x + 10$.

$$
\begin{array}{r|rrrrr}
2 & 3 & -6 & 0 & -5 & 10 \\
 & & 6 & 0 & 0 & -10 \\
\hline
 & 3 & 0 & 0 & -5 & \boxed{0}
\end{array}
$$

$\leftarrow$ remainder 0, so $x-2$ <u>is</u> a factor.