Section 02-03 Sample Quiz - Synthetic & Long Division

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Simplify the following expression by dividing:
\[
\frac{8p^6 + 12p^9}{2p^3}
\]

a. \(4p^3 + 6p^6\)  
b. \(4p^2 + 6p^3\)  
c. \(6p^3 + 10p^6\)  
d. \(6p^2 + 10p^3\)

____ 2. Use Long Division to Divide the Polynomials.
\[
\left( x^4 + 7x^3 + 17x^2 + 20x \right) \div \left( x^2 + 4 \right)
\]

a. \(x^2 + 13x + 7 + \frac{-52}{x^2 + 4}\)  
b. \(x^2 + 7x + 13 + \frac{-8x - 52}{x^2 + 4}\)  
c. \(x^2 + 7x + 13 + \frac{-8x - 52}{x^2 + 4}\)  
d. \(x^2 + 1 + \frac{1}{x^2 + 4}\)

____ 3. A student is trying to use long division (at the right) to solve the following
\[(3x^3 - 4x^2 - x + 1) \div (x + 1)\]
What value should go in the box next?

a. \(-2x\)  
b. \(2x\)  
c. \(-7x\)  
d. \(7x\)

____ 4. Divide using Synthetic division:
\[(x^3 + 5x^2 + 5x - 2) \div (x + 2)\]

a. \(x^2 - 3x + 1\)  
b. \(x^2 + 3x + 1\)  
c. \(x^2 - 3x - 1\)  
d. \(x^2 + 3x - 1\)
5. A student is trying to use long division (at the right) to solve the following
\((8x^3 - 2x^2 + 7x + 1) \div (2x + 1)\).
What value should go in the box next?

\[
\begin{array}{c|ccccc}
2x + 1 & 8x^3 & -2x^2 & +7x & +1 \\
- & \underline{8x^3} & \underline{+4x^2} \\
& -6x^2 & +7x & \\
- & \underline{-6x^2} & \underline{-3x} \\
& 10x^2 & -1 \\
- & \underline{10x^2} & \underline{+5} \\
& -6
\end{array}
\]

\[a. \ - \frac{6}{2x + 1} \quad b. \ - \frac{2x + 1}{6} \quad c. \ + \frac{6}{2x + 1} \quad d. \ + \frac{2x + 1}{6}\]

6. Cam divided \(x^4 + 3x^2 - 4x - 2\) by the factor \(x-2\) using synthetic division. His work is shown. Identify his mistake.

\[
\begin{array}{c|cccc}
2 & 1 & 3 & -4 & -2 \\
\downarrow & 2 & 10 & 12 \\
1 & 5 & 6 & 10
\end{array}
\]

\[x^3 + 5x^2 + 6x + \frac{10}{x-2}\]

\[a. \ Cam \ wrote \ the \ remainder \ incorrectly. \quad b. \ Cam \ did \ not \ use \ a \ zero \ place \ holder \ for \ the \ \ x^3 \ \ term. \quad c. \ Cam \ added \ instead \ of \ subtracting \ the \ rows. \quad d. \ Cam \ should \ have \ used \ -2 \ as \ his \ division \ since \ the \ factor \ was \ x-2.\]