

6 3 dividing polynomials worksheet

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Simplifying Polynomials with 6:3 Dividing Polynomials Worksheet

In algebra, dividing polynomials is a crucial skill for simplifying complex expressions. The 6:3 dividing polynomials worksheet is a valuable tool for students to practice dividing polynomials with a degree of 6 by a divisor of degree 3.

Question 1:

Divide the polynomial $P(x) = x^6 - 3x^5 + 2x^4 - 5x^3 + 4x^2 - 3x + 2$ by the divisor $g(x) = x^3 - 2x^2 + 3x - 4$.

Answer:

Using long division, we obtain:

$$\begin{array}{r} x^3 - x^2 + 2x + 1 \\ \hline x^3 - 2x^2 + 3x - 4 \mid x^6 - 3x^5 + 2x^4 - 5x^3 + 4x^2 - 3x + 2 \\ \underline{-3x^5 + 6x^4 - 9x^3 + 16x^2} \\ -4x^4 + 9x^3 - 12x^2 + 8x \\ \underline{-9x^3 + 18x^2 - 24x + 8} \\ -18x^2 + 36x - 26 \\ \hline \end{array}$$

$$\begin{array}{r}
 -36x + 72 - 32 \\
 \hline
 -56
 \end{array}$$

Therefore, the quotient is $x^3 - x^2 + 2x + 1$ and the remainder is -56 .

Question 2:

Divide the polynomial $Q(x) = x^6 + 2x^5 - 3x^4 + 4x^3 - 5x^2 + 6x - 7$ by the divisor $h(x) = x^3 + x^2 - 2x + 3$.

Answer:

Using long division, we obtain:

$$\begin{array}{r}
 x^3 + x + 1 \\
 \hline
 x^3 + x^2 - 2x + 3 \mid x^6 + 2x^5 - 3x^4 + 4x^3 - 5x^2 + 6x - 7 \\
 \underline{-x^6 - x^5 + 2x^4 - 3x^3} \\
 3x^5 - x^4 + x^3 + 4x^2 \\
 \underline{-3x^5 - 3x^4 + 6x^3 - 9x^2} \\
 2x^4 - 5x^3 + 15x^2 \\
 \underline{-2x^4 - 2x^3 + 4x^2} \\
 -3x^3 + 11x^2 - 6x \\
 \underline{-3x^3 - 3x^2 + 6x} \\
 14x^2 - 12x - 7 \\
 \underline{}
 \end{array}$$

Therefore, the quotient is $x^3 + x + 1$ and the remainder is $14x^2 - 12x - 7$.

Question 3:

Divide the polynomial $R(x) = -x^6 + x^5 + 2x^4 - 3x^3 + 4x^2 - 5x + 6$ by the divisor $k(x) = x^3 - x^2 + 2x - 3$.

Answer:

Using long division, we obtain:

$$\begin{array}{r}
 -x^3 - x - 2 \\
 \hline
 x^3 - x^2 + 2x - 3 \mid -x^6 + x^5 + 2x^4 - 3x^3 + 4x^2 - 5x + 6 \\
 \underline{-x^6 + x^5 + 2x^4 - 3x^3} \\
 0 + 2x^4 + 0 - 0 \\
 \underline{-2x^4 + 2x^3 - 4x^2 + 6x} \\
 2x^4 - 2x^3 + 4x^2 - 6x \\
 \underline{-2x^4 + 2x^3 - 4x^2 + 6x} \\
 0 - 4x^3 + 8x^2 - 12x \\
 \underline{-4x^3 + 4x^2 + 8x - 12} \\
 -8x^2 + 20x - 36 \\
 \underline{-8x^2 + 20x - 36} \\
 0
 \end{array}$$

Therefore, the quotient is $-x^3 - x - 2$ and the remainder is $-8x^2 + 20x - 36$.

Question 4:

Divide the polynomial $S(x) = 2x^6 - 3x^5 + 4x^4 - 5x^3 + 6x^2 - 7x + 8$ by the divisor $m(x) = 2x^3 - x^2 + 3x - 4$.

Answer:

Using long division, we obtain:

$$\begin{array}{r}
 x^3 - 2x + 4 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
2x^3 - x^2 + 3x - 4 \mid 2x^6 - 3x^5 + 4x^4 - 5x^3 + 6x^2 - 7x + 8 \\
\hline
-2x^6 + x^5 - 3x^4 + 2x^3 \\
\hline
2x^5 - x^4 + 2x^3 + 6x^2 \\
\hline
-2x^5 + x^4 - 3x^3 + 2x^2 \\
\hline
4x^3 - 4x^2 + 7x - 8 \\
\hline
\end{array}$$

Therefore, the quotient is $x^3 - 2x + 4$ and the remainder is $4x^3 - 4x^2 + 7x - 8$.

Question 5:

Divide the polynomial $T(x) = x^6 - 4x^5 + 3x^4 - 2x^3 + 5x^2 - 6x + 7$ by the divisor $n(x) = x^3 + 2x^2 - 3x + 4$.

Answer:

Using long division, we obtain:

$$\begin{array}{r}
x^3 - 6x + 7 \\
\hline
x^3 + 2x^2 - 3x + 4 \mid x^6 - 4x^5 + 3x^4 - 2x^3 + 5x^2 - 6x + 7 \\
\hline
-x^6 - 2x^5 + 3x^4 + 4x^3 \\
\hline
-2x^5 - 2x^4 - x^3 + 5x^2 \\
\hline
2x^5 + 4x^4 + 6x^3 - 8x^2 \\
\hline
-6x^4 - 7x^3 + 13x^2 - 6x \\
\hline
7x^3 - 14x^2 + 28x - 7 \\
\hline
\end{array}$$

Therefore, the quotient is $x^3 - 6x + 7$ and the remainder is $7x^3 - 14x^2 + 28x - 7$.

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