

1. What is the quotient when $x^4 + 4x^3 - 8x^2 - 24x - 45$ is divided by $2x^2 + 6$?

2. What is the remainder when $x^4 + 4x^3 - 8x^2 - 24x - 45$ is divided by $x^2 + 3$?

3. What polynomial division is represented by the synthetic division

$$\begin{array}{r|rrrr}
 -4 & 2 & 9 & 0 & -32 \\
 & & -8 & -4 & 16 \\
 \hline
 & 2 & 1 & -4 & -16
 \end{array}$$

4. What are all possible rational roots of the function $f(x) = 4x^3 + 9x^2 - 13x + 14$?

5. Complete the synthetic division table.

$$\begin{array}{r|rrrr}
 -2 & 1 & 3 & 0 & -4 \\
 & & -2 & -10 & -20 \\
 \hline
 & 1 & _ & _ & _
 \end{array}$$

6. How many negative, real roots does the function $x^4 + 4x^3 - 8x^2 + 24x - 45 = f(x)$ have?