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<tr>
<td>1. If ( P(x) = 4x^4 - 3x^3 + 7x - 2 ), use synthetic division to find ( P(-1/4) ).</td>
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<td>2. Find all the roots if: ( x^4 - 2x^3 + x^2 - 4 = 0 ) and ( x = -1 ) and 2</td>
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<td>3. When ( P(x) ) is divided by ( 2x + 1 ), the quotient is ( x^2 - x + 4 ) and the remainder is 3. Find ( P(x) ).</td>
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<td>4. Sketch the graph of ( f(x) = 4x^4 - 24x^3 + 35x^2 + 6x - 9 ), if ( x = 3 ) is a double root. Find the other roots!</td>
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<td>5. Sketch the graph of (without a graphing calculator) ( f(x) = 1 - 3x - 2x^2 ). Determine the vertex and intercepts (x and y)</td>
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6. A rectangular piece of sheet metal with perimeter 50cm is rolled into a cylinder with open ends. \((V = \pi r^2 h)\)

   a. Express the volume of the cylinder as a function of \(x\).

   b. Give the domain.

   c. Find the approximate value of \(x\) that maximizes the volume.

   d. Give the approximate maximum Volume.

7. Use the rational Zero Theorem to find all the roots of \(2x^4 - x^3 - 7x^2 + x + 2 = 0\)

8. Find the quartic (4th degree) function with integral coefficients that has roots \(5 - i\sqrt{3}\) and \(i\).


   a. \(i^9 - i^{24} + i^{41}\)

   b. \((2 - 2i\sqrt{3})^2\)

   c. \(i^{-17}\)

10. Graph the following rational functions. (without the use of a graphing Calculator)

    a. \(y = \frac{3x - 4}{x + 6}\)

        vertical asymptotes:
        horizontal asymptotes:
        x-intercept(s):
        y-intercepts:

    b. \(y = \frac{x^2 - x - 6}{x - 2}\)

        vertical asymptotes:
        slant asymptotes:
        x-intercept(s):
        y-intercepts:

11. Find the equation of the rational function.

    Vertical asymptote: \(x = -1\)
    Slant asymptote: \(y = -x + 2\)
    x-intercept: \(x = 3\)