1. What is the end behavior of the polynomial function f(x) = -2x^5 + 3x^3 - x + 4?
    - a) f(x) approaches infinity as x approaches infinity, and f(x) approaches infinity as x approaches negative infinity.
    - b) f(x) approaches negative infinity as x approaches infinity, and f(x) approaches negative infinity as x approaches negative infinity.
    - c) f(x) approaches negative infinity as x approaches infinity, and f(x) approaches infinity as x approaches negative infinity.
    - d) f(x) approaches infinity as x approaches infinity, and f(x) approaches negative infinity as x approaches negative infinity.

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2. Identify the vertical asymptote(s) of the rational function $f(x) = \frac{(2x\text{^}2 + 3x)}{(x\text{^}2 - 4)}$:
    - a) x = -2 and x = 2
    - b) x = 0
    - c) x = -4 and x = 4
    - d) No vertical asymptotes

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3. What is the degree and leading coefficient of the polynomial function $f(x) = 4x\text{^}3 - 7x\text{^}2 + 5x - 2$?
    - a) Degree 3, leading coefficient 4
    - b) Degree 4, leading coefficient 4
    - c) Degree 3, leading coefficient -7
    - d) Degree 4, leading coefficient -7

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4. Which of the following is the simplified form of $\frac{(x\text{^}2 - 4)}{(x\text{^}2 - x - 6)}$?
    - a) (x - 2) / (x - 3)
    - b) (x + 2) / (x - 3)
    - c) (x - 2) / (x + 3)
    - d) (x + 2) / (x + 3)

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5. Factor the polynomial f(x) = x^4 - 5x^2 + 4 completely.

6. Sketch the graph of $f(x) = (\frac{2}{(x-3)}) + 1$. Indicate the vertical asymptote, horizontal asymptote, and any intercepts.

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7. Find the equation of a polynomial function with roots $x = 1, x = -2, x = 3$ and degree 3, if its leading coefficient is 2.

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8. Solve the inequality $\frac{(2x+1)}{(x-4)} \leq 0$ and represent the solution on a number line.

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9. A company's profit can be modeled by the polynomial $P(x) = -2x\text{^}3 + 12x\text{^}2 - 20x + 5$, where x represents the number of items produced in thousands.
    - a) Find the profit when x = 3.
    - b) Determine the number of items produced that maximizes profit by finding the critical points of P(x).

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10. For the rational function $f(x) = \frac{(x\text{^}2 - 2x - 3)}{(x\text{^}2 - 9)}$:
    - a) Determine the vertical and horizontal asymptotes.
    - b) Identify any removable discontinuities.
    - c) Sketch the graph, clearly labeling key features.

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11. Given the polynomial $f(x) = x\text{^}3 - 4x\text{^}2 + x + 6$:
    - a) Use synthetic division to determine if x - 2 is a factor of f(x).
    - b) Fully factor f(x).
    - c) Sketch the graph, labeling all intercepts and describing the end behavior.

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12. Real-World Application Problem:
    A rectangular storage container with an open top has a volume of 1000 cubic meters. The width is twice the length. The cost of materials for the base is $10 per square meter, and the cost for the sides is $5 per square meter. Write a rational function for the cost of the materials as a function of the length of the base and determine the dimensions that minimize the cost.