

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Perform the following operations and simplify

(a)
$$\frac{5x^3 - 20x^2}{3x^2 - 15x - 42} \div \frac{x^3 - 3x^2 - 4x}{6x^2 + 42x + 60} =$$

(b)
$$\frac{x}{3x^2 - 27} - \frac{1}{6x + 18} + \frac{5}{2x - 6} =$$

2. Divide $x^5 - 3x^3 + 2x$ by $x^2 - 7$ and clearly state the quotient and the remainder.

3. Use synthetic division to compute $P(2)$ if $P(x) = -x^5 + 5x^2 + 3x$.
4. An auto dealership sells both domestic and imported vehicles. If the ratio of the domestic to the imported cars they sell in a month is 9 to 2 and they sell 56 more domestic than imported vehicles, how many cars do they sell in total per month?
5. (a) Use synthetic division to find the quotient and the remainder of $(x^3 - 13x^2 + 52x - 60) \div (x - 5)$.
- (b) Write the answer in the form (Dividend) = (Divisor)(Quotient) + (Remainder).
- (c) Use your answer in Part (b) to solve the equation $x^3 - 13x^2 + 52x - 60 = 0$.