Name: _____

Directions: You *must* show all your work in the provided space. Simplify your answers whenever possible. Be certain to indicate your final answer clearly.

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1. Perform the indicated operations:

    (a) $(4a - 3b)(3a + 5b)$

    (b) $(2x - 5)^2$

    (c) $(3x - 4)(3x + 4)$

    (d) $\dfrac{12x^3y^2 + 9x^2y^3 - 8x^2y - 6xy^2 + 2x}{6xy}$

    (c) $\dfrac{10x^2 - 3x - 18}{2x - 3}$

    (d) $\dfrac{x^4 - 2x^3 + 3x^2 - 2x + 5}{x^2 + 1}$

2. Find a polynomial that expresses the area of a rectangle that has sides $3x - 5$ and $8x + 2$.

3. Find a polynomial that expresses the volume of a cube of side $(2x + 1)$.

4. What is the remainder of the following division: $\dfrac{2x^{45} - 3x^{21} + 5}{x - 1}$?

5. **Extra Credit** Student Y. Ecks performed the following calculation

$$(x + 2)^2 = x^2 + 4$$

   (a) Explain why this calculation is wrong in general.

   (b) Is there a value of x for which this calculation is nevertheless true?