Finding Perimeter and Area Using Polynomials

1. What is the distance around the rectangle if the length is $3x^2 + 6x - 10$ and the width is $3x + 5$?

2. If the perimeter of the pentagon below is $7x^4 + 9x^3 - 6x^2 + 10$, what is the length of the missing side?

3. If the perimeter of the square below is $12x^5 - 8x^2 + 20x - 4$, what is the length of one side?

4. Ana knows that the perimeter of her backyard is $(6x^2 + 14x)$ feet. If the length of her backyard is $(2x^2 + 3x - 7)$ feet, what is the width of her backyard?
5. The area of the square below is represented by the expression $4x^2 + 4x + 1$. The area of the rectangle is represented by the expression $x^2 - 5x + 6$. Using the diagram below, find the area of the shaded region.

![Diagram of a square and a rectangle]

6. A rectangular piece of wood has an area of $5x^4 + 3x^2 - 6x + 8$. If two identical circles are cut out of the wood and the area of EACH circle is $x^2 - 2$, find the area of the remaining piece of wood. (Hint: Use the picture below.)

![Diagram of a rectangle with two circles cut out]

7. A circular plot of land has an area of $7x^5 - x^3 + 4x^2 + 9$. If the walkway around this piece of land has an area of $x^4 - 4x^3 + 2x$, what is the area of the land and walkway combined?

![Diagram of a circle with a walkway]

8. The width of Adrian’s bedroom is $(x - 5)$ feet. He knows that the length is four times the width. Find the perimeter of Adrian’s bedroom.