1. Find the intervals in which $p(t) > q(t)$. Do it twice, first using the Context Menu, and second using the solve keyword. Then give the exact solution in standard interval notation.

$$p(t) = t^4 + 4t^3 + 7t^2 - 3t - 4 \text{ and } q(t) = 10 + 2t - 4t^2 - 3t^3$$

2. Find all points of intersection between the functions g and h. Use the *fsolve* command to solve this problem. Any approximations should be to the nearest ten-thousandth. Check if solutions are reasonable. Give your answer in a sentence.

$$g(x) = x^3 - 2x^2 + 3x + 1 \text{ and } h(x) = 5\sin 2x$$

3. Find all solutions to the equation using the *solve* command. Then use the context menu to select the first entry and approximate it to both five digits and to twenty digits. Then use the *fsolve* command to solve the equation. Comment on your answers and what you think is going on.

$$2x^3 - 5x + 8 = 3 + 5x - x^2$$

4. Define two equations. Let *equation1* be $\dfrac{x^2 - 5x + 6}{x^2 - 4} = -\dfrac{1}{4}$ and *equation2* be what you get from *equation1* when you multiply by the least common denominator. Solve both equations. Comment on the results.

5. Find the roots of the function f in the given interval. Give the exact answers if possible and any approximate solutions should be to the nearest 0.0001.

$$f(x) = \left(x^2 + 2x - 5\right)\sin\left(x^2 + 2x - 2\right) \text{ for } x \in [0, 2.5]$$

6. The distance an oscillating piston, in centimeters, is from the top of its encasement is given by a function $L(t)$ where t represents time in seconds. Find when the piston is within seven centimeters of the top of its encasement during the first ten seconds. If reasonable, find the exact values. Any approximations should be to the nearest thousandth.

$$L(t) = 10 + 6\sin 2t$$