

SHOW YOUR WORK!!**I. In Problem 1, factor the polynomial completely.**

1.)
$$p(x) = x^8 - 2x^7 - 15x^6 + 42x^5 + 3x^4 - 78x^3 + 35x^2 + 38x - 24$$

II. In Problems 2-3, solve the polynomial equation (exact answers).

2.)
$$x^7 + 7x^4 + 4x + 4 = 3x^6 + x^5 + 4x^3 + 8x^2$$
, given that $x = 1 + i$ is a solution.

3.)
$$x^8 + 24x^5 + 19x^2 + 30 = 4x^7 + 3x^6 + 15x^4 + 12x^3 + 40x$$
,
given that $x = \sqrt{2}$ and $x = -\sqrt{5}$ are solutions.