

Name: (please print name as it appears in Canvas here →) _____.

MATH 334:

SAM 5: POLYNOMIAL ALGEBRA [10PTS]

Box or underline your answer. Work should be shown on this document. Thanks!

Problem 1 Complete the square to factor the following polynomials completely over $\mathbb{R}$ or to establish that the polynomial is irreducible over $\mathbb{R}$:

(a.) $x^2 + 4x + 29$

(b.) $x^2 - 13x + 42$

Problem 2 Completely factor the following polynomials over $\mathbb{R}$:

(a.) $2x^2 + 4x + 2$

(b.) $6x^2 - x - 1$

(c.) $x^4 - 16$

(d.) $x^3 - 3x^2 + 2x$

(e.) $x^4 + 4x^3 + 5x^2$

(f.) $x^3 - 8$

(g.) $x^4 + 6x^3 + 16x^2 + 18x + 39$ (hint: $i\sqrt{3}$ is a root of this polynomial)