

Math 151 - Quiz 8

April 13, 2016

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (4 points) Find the real and complex zeros of $f(x) = x^3 - 6x^2 + 13x$.

$$x(x^2 - 6x + 13) = 0$$

↓
 $x = 0$

↓
$$x = \frac{6 \pm \sqrt{36 - 4(13)}}{2} = \frac{6 \pm \sqrt{-16}}{2} = \frac{6 \pm 4i}{2} = 3 \pm 2i$$

$$x = 0, x = 3 + 2i, x = 3 - 2i$$

2. (4 points) Determine the factored form of a polynomial with real coefficients whose zeros are $x = 1$, $x = -4$, and $x = 3 - i$ and whose graph passes through $(0, 6)$.

$$A(x-1)(x+4)(x-(3-i))(x-(3+i))$$

$$6 = A(-1)(4)(3-i)(3+i)$$

$\underbrace{(3-i)(3+i)}_{9-i^2=10}$

$$6 = A(-1)(4)(10) \Rightarrow 6 = -40A \Rightarrow A = -\frac{6}{40}$$

3. (2 points) One of the zeros of $3x^2 - 42x + 222$ is $7 + 5i$. Determine the other zero.

$$7 - 5i$$