

# 13 Quiz 13 MAT 1275 Professor Chiu

Name: \_\_\_\_\_

- This quiz consists of 2 questions, each worth 5 points for a total of 10 points.
- You have 15 minutes to complete the quiz.
- Show all work and justify your answers.
- Scientific calculators are allowed.
- Wishing you success.

1. Divide:

① Rationalize by the conjugate of  $3+i$ :  $3-i$

$$(3+i) \cdot (3-i) = 9+1+3i-3i = 10$$

3	9	3i
-i	-3i	-i <sup>2</sup>

$-i^2 = -(-1) = 1$

$i = \sqrt{-1} \Rightarrow i^2 = -1$

2. Solve

Quadratic Formula

$$Ax^2 + Bx + C = 0$$

$$X = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

$$x^2 - 6x + 10 = 0$$

$A=1, B=-6, C=10$

$$X = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \cdot 1 \cdot 10}}{2 \cdot 1} = \frac{6 \pm \sqrt{36-40}}{2}$$

$\Rightarrow 36-40 = -4$

$$X = \frac{6 \pm \sqrt{-4}}{2} = \frac{6 \pm \sqrt{4}i}{2} = \frac{6 \pm 2i}{2}$$

$$X = \frac{\cancel{2}(3 \pm i)}{\cancel{2}} = 3 \pm i$$

②  $(5-2i) \cdot (3-i)$

$$\frac{5-2i}{3+i} \cdot \frac{3-i}{3-i} = \frac{(5-2i)(3-i)}{(3+i)(3-i)}$$

$$\stackrel{\text{① \& ②}}{=} \frac{15-2-6i-5i}{10}$$

$$= \frac{13-11i}{10} = \boxed{\frac{13}{10} - \frac{11}{10}i}$$

5	-2i
3	15
-i	-6i
	2i <sup>2</sup>

$\downarrow$   
 $2 \cdot (-1) = -2$