8 Quiz 8 MAT 1275 Professor Chiu

Name: Sol

- This quiz consists of **2** questions, each worth 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. Completely factor $4x^2 - 16$ and check your answer by distributing.

① Find GCF of $4x^2-16$: $4x^2-16 = 4(x^2-4)$

② Using $x^2-a^2=(x+a)(x-a)$ to factor x^2-4:

$$x^2-4 = x^2-2^2 = (x+2)(x-2)$$

③ Using ① and ②, we can completely factor $4x^2-16$:

$$4x^2-16 = \underset{\text{by ①}}{4(x^2-4)} = \underset{\text{by ②}}{4(x+2)(x-2)}$$

2. Completely factor: $5x^2 - x - 6$

$5x^2-x-6$

x

$5x$

Ⅰ Split $5x^2$ into x and $5x$

Ⅱ split "-6" into two numbers:

① $-6 = (-1)\times 6$
② $-6 = (-2)\times 3$
③ $-6 = (-3)\times 2$
④ $-6 = (-6)\times 1$
⑤ $-6 = 6 \times (-1)$
⑥ $-6 = 3 \times (-2)$
⑦ $-6 = 2 \times (-3)$
⑧ $-6 = 1 \times (-6)$

Ⅲ Test 8 possibilities from Ⅱ by doing products crossly, summing products up, and check if the sum matches the middle term:

① x → (-1), $5x$ → 6

$6x + (-1)5x = 1x$

⇒ not matching but close to "$-x$"

switching ⑧ "$-$" sign

⑧ x → 1, $5x$ → -6

$(-6)\cdot x + 1\cdot 5x = -x$

⇒ matching with the middle term

Ⅳ Write down the result:

$$5x^2 - x - 6 = (x + 1)(5x - 6)$$

x → 1, $5x$ → -6