## Math 412 Quiz 6 Thursday, February 22

Good job Just be careful when operating with quotient rings

You have 15 minutes to complete the quiz. You may turn in corrections for up to half credit back by the beginning of the next class period.

Name: Clivin Fan

1. (3 points) Let R be a ring and let I be an ideal of R. What does R/I mean?

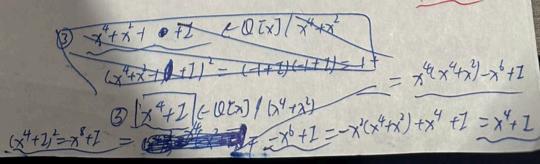
2. (4 points) Circle all the subsets that are ideals of the given ring.

- a) The subset of  $\mathbb{Z}$  of all even numbers.
- (d) All linear combinations of 4 and 10 in  $\mathbb{Z}$ .
- b) The subset of  $\mathbb Z$  of all odd numbers.  $\times$
- (e)  $\{0\} \subseteq \mathbb{R}[x]$ .
- (c) Matrices in  $M_2(\mathbb{Z})$  with even entries.
- f) The set  $\{r+r\mid r\in\mathbb{Z}_5\}$  in  $\mathbb{Z}_5$ .
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- 0 2 4 X 1 0+0=0 1+1 = 2 2+2 = 4 3+3 = 1
- so actually S = 25. Therefore S is an ideal of  $Z_{25}$  since the ideal of  $Z_{25}$  since the ideal of  $Z_{25}$  in an

3. (3 points) An element a of a ring R is said to be idempotent if  $a^2 = a$ . Find at least 3 ideal of the description idempotents in the quotient ring  $\mathbb{Q}[x]/(x^4 + x^2)$ .

- $2 \frac{[0+I] \in (QIx]/(x^4+x^2)}{(0+2)^2 = (0+I)(0+I) = 0+I}$



[x1+]] =[-x2+1] isr+ idempotant

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