

HOMework 1

MATH 3140

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ABSTRACT. This is Homework 1. The problems are from Fraleigh [Fra03, §0–4]:

- HW1a Fraleigh Exercises 0: 2, 4, 10, 12, 14, 17, 18, 19, 28, 30, 31, 36.
- HW1b Fraleigh Exercises 1: 4, 9, 12, 17, 37, 38.
- HW1c Fraleigh Exercises 2: 2, 6, 24, 26, 29, 36.
- HW1d Fraleigh Exercises 3: 4, 8, 12, 16, 26, 27.
- HW1e Fraleigh Exercises 4: 2, 4, 11, 19, 29, 31.

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SECTION 0

Exercise 0.2. Describe the set $\{m \in \mathbb{Z} \mid m^2 = 3\}$ by listing its elements.

Solution. Since there is no integer whose square is equal to 3, we have that

$$\{m \in \mathbb{Z} \mid m^2 = 3\} = \{ \};$$

i.e., the empty set \emptyset .

Exercise 0.4. Describe the set $\{m \in \mathbb{Z} \mid m^2 - m < 115\}$ by listing its elements.

Solution.

Exercise 0.10.

Solution.

Exercise 0.12.

Solution.

Exercise 0.14.

Solution.

Exercise 0.17.

Solution.

Exercise 0.18.

Solution.

Exercise 0.19.

Solution.

Exercise 0.28.

Solution.

Exercise 0.30.

Solution.

Exercise 0.31.

Solution.

□

Exercise 0.36.

Solution.

□

SECTION 1

Exercise 1.4.*Solution.***Exercise 1.9.***Solution.***Exercise 1.12.***Solution.***Exercise 1.17.***Solution.***Exercise 1.37.***Solution.***Exercise 1.38.***Solution.*

SECTION 2

Exercise 2.2.*Solution.***Exercise 2.6.***Solution.***Exercise 2.24.***Solution.***Exercise 2.26.***Solution.***Exercise 2.29.***Solution.***Exercise 2.36.***Solution.*

SECTION 3

Exercise 3.4.*Solution.***Exercise 3.8.***Solution.***Exercise 3.12.***Solution.***Exercise 3.16.***Solution.***Exercise 3.26.***Solution.***Exercise 3.27.***Solution.*

SECTION 4

Exercise 4.2.*Solution.***Exercise 4.4.***Solution.***Exercise 4.11.***Solution.***Exercise 4.19.***Solution.***Exercise 4.29.***Solution.***Exercise 4.31.***Solution.*

REFERENCES

[Fra03] John Fraleigh, *A First Course in Abstract Algebra*, Seventh edition, Addison Wesley, Pearson, 2003.

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