

CHAPTER 2, QUESTION 30

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30. Use Question 14 to determine the irreducibles in  $\mathbb{Z} + \mathbb{Z}\sqrt{-2}$ .

Solution. An argument similar to that of the solution to Question 29 shows that the irreducibles in  $\mathbb{Z} + \mathbb{Z}\sqrt{-2}$  are

$$\begin{aligned} &\pm\sqrt{-2}; \pm(x + y\sqrt{-2}), \text{ where } x^2 + 2y^2 = p \text{ (prime)} \equiv 1 \text{ or } 3 \pmod{8}; \\ &\pm p, \text{ where } p \text{ is a prime } \equiv 5 \text{ or } 7 \pmod{8}. \quad \blacksquare \end{aligned}$$

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