Chapter 4

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Exercise (2). If x is an odd integer, then x^3 is odd.	
Proof. Write your answer here.	
Exercise (4). Suppose $x, y \in \mathbb{Z}$. If x and y are odd, then xy is odd.	
Proof. Write your answer here.	
Exercise (6). Suppose $a, b, c \in \mathbb{Z}$. If $a \mid b$ and $a \mid c$, then $a \mid (b + c)$.	
Proof. Write your answer here.	
Exercise (11). Suppose $a, b, c, d \in \mathbb{Z}$. If $a \mid b$ and $c \mid d$, then $ac \mid bd$.	
Proof. Write your answer here.	
Exercise (12). If $x \in \mathbb{R}$ and $0 < x < 4$, then $\frac{4}{x(4-x)} \ge 1$.	
Proof. Write your answer here.	
Exercise (14). If $n \in \mathbb{Z}$, then $5n^2 + 3n + 7$ is odd. (Try cases.)	
Proof. Write your answer here.	
Exercise (16). If two integers have the same parity, then their sum is even. (Try cases.)	
Proof. Write your answer here.	
Exercise (18). Suppose x and y are positive real numbers. If $x < y$, then $x^2 < y^2$.	
Proof. Write your answer here.	
Exercise (20). If a is an integer and $a^2 \mid a$, then $a \in \{-1, 0, 1\}$.	
Proof. Write your answer here.	
Exercise (26). Every odd integer is a difference of two squares.	
Proof. Write your answer here.	
Exercise (28). Let $a, b, c \in \mathbb{Z}$. Suppose a and b are not both zero, and $c \neq 0$. Prove to $\gcd(a, b) \leq \gcd(ca, cb)$.	hat
Proof. Write your answer here.	
Exercise (Reflection Problem). Answer the following questions:	
Proof.	
 How long did it take you to complete each problem? Write your answer here. What was easy? Write your answer here. What was challenging? What made it challenging? 	
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Write your answer here. • Compare your answers to the odd numbered exercises to those in the back of the

textbook. What did you learn from this comparison? Write your answer here.