1. Exercise set 3.1

†2b: Yes: $6r + 4s^2 + 3 = 2(3r + 2s^2 + 1) + 1$, where $3r + 2s^2 + 1$ is an integer (since r and s are integers). Therefore, it is odd, by definition.

4: Yes: for $a = b = 0$, we have $\sqrt{0+0} = 0 = \sqrt{0} + \sqrt{0}$.

†9: The values of $n^2 - n + 11$ for $1 \leq n \leq 10$ are (in order): $11, 13, 17, 23, 31, 41, 53, 67, 83, 101$, which are all prime numbers. □

†12: Let m and n be two odd numbers. By definition, $m = 2k + 1$ and $n = 2l + 1$, for some integers k and l. Adding the two equations yields: $m + n = 2k + 1 + 2l + 1 = 2(k + l + 1)$, which is even, by definition. □

†16: For instance, take $a = -5$, $b = 2$. Then $a < b$, but $a^2 = 25 \not< 4 = b^2$.

35: For instance, take $n = 11$. Then $n^2 - n + 11 = 11^2$, which is not prime.

2. Exercise set 3.2

†2: 39602/10000 = 19801/5000

†15: Let $m = \frac{a}{b}$ and $n = \frac{c}{d}$ be any two rational numbers. The difference is

$$m - n = \frac{a}{b} - \frac{c}{d} = \frac{ad}{bd} - \frac{bc}{bd} = \frac{ad - bc}{bd},$$

which is a rational number. □