

In your solutions you must explain what you are doing using complete sentences.

- Section 1.5 Number 8
- Section 1.5 Number 24
- Section 3.1 Number 2
- Section 3.1 Number 5
- **Proof of No Largest Prime** - In the proof that there were an infinite number of primes we used the fact that if  $p_1, p_2, \dots, p_n$  is a list of primes then  $p_1 p_2 \cdots p_n + 1$  is a number not divisible by any of the listed primes. However we never claimed that  $p_1 p_2 \cdots p_n + 1$  is actually prime. Is it always prime? Observe that

$$- 2 + 1$$

$$- 2 \times 3 + 1$$

$$- 2 \times 3 \times 5 + 1$$

$$- 2 \times 3 \times 5 \times 7 + 1$$

are all prime. However, if you follow this pattern you will find a composite number eventually. Find the three smallest composite numbers of the form  $p_1 p_2 \cdots p_n + 1$ .