1. (*Exeter 1.92.3*) Most positive integers can be expressed as a sum of two or more consecutive positive integers. For example,

$$24 = 7 + 8 + 9$$
$$36 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8$$
$$51 = 25 + 26$$

A positive integer that cannot be expressed as a sum of two or more consecutive positive integers is therefore *interesting*. The simplest example of an interesting number is 1.

(a) Find three more interesting numbers.

(*Hint: If you're not sure where to start, test the first 10 positive integers.*)

(b) Show that 14 is not an interesting number.

(c) Show that 82 is not an interesting number.

(d) Can you find any interesting numbers that are odd?

(e) What happens when you add two consecutive positive integers?

(f) What happens when you add three consecutive positive integers?

(g) What happens when you add four consecutive positive integers?

(h) What happens when you add five consecutive positive integers?

(i) What happens when you add n consecutive positive integers?

(j) Find three ways to show that 190 is not an interesting number.

(k) Find three ways to show that 2004 is not an interesting number.

(l) How many interesting numbers precede 2018?