You have been assigned into groups of three for the week. Write down your colleagues’ names and email addresses.

2. A number is called rational if it can be written as \( p/q \), where \( p \) and \( q \) are integers and \( q \neq 0 \). The rational numbers are “dense” in the real numbers: that is, between any two real numbers \( x \) and \( y \) there is a rational number \( p/q \). Figure out why this is true, and explain it clearly.
3. A real number that is not rational is called *irrational*. Favorite examples include $\sqrt{2}$ and $\pi$. The irrational numbers are also dense: between any two real numbers $x$ and $y$ there is an irrational number $z$. Figure out why this is true, and explain it clearly.

4. What is the next rational number after $\pi$?
5. You’re probably used to identifying a real number with its decimal representation: if $a$ is a number between 0 and 1, you can write

$$a = 0.a_1a_2a_3a_4a_5\ldots,$$

where $a_0, a_1, \ldots$ are integers between 0 and 9. Suppose that $b$ is another number between 0 and 1, and that its decimal expansion is

$$b = 0.b_1b_2b_3b_4b_5\ldots.$$

Explain clearly how to find the decimal expansion of $a + b$. This may sound obvious, but you’ll find there are some subtleties.