The Terminators

Write the decimal equivalent of each of the following fractions. If the fraction does not terminate, write at least 6 numbers after the decimal point.

\[
\begin{align*}
\frac{1}{2} &= \quad \frac{2}{2} &= \quad \frac{3}{2} &= \quad \frac{4}{2} = \\
\frac{1}{3} &= \quad \frac{2}{3} &= \quad \frac{3}{3} &= \quad \frac{4}{3} = \\
\frac{1}{4} &= \quad \frac{2}{4} &= \quad \frac{3}{4} &= \quad \frac{4}{4} = \\
\frac{1}{5} &= \quad \frac{2}{5} &= \quad \frac{3}{5} &= \quad \frac{4}{5} = \\
\frac{1}{6} &= \quad \frac{2}{6} &= \quad \frac{4}{6} &= \quad \frac{5}{6} = \\
\frac{1}{7} &= \quad \frac{2}{7} &= \quad \frac{4}{7} &= \quad \frac{5}{7} = \\
\frac{1}{8} &= \quad \frac{3}{8} &= \quad \frac{5}{8} &= \quad \frac{7}{8} = \\
\frac{1}{9} &= \quad \frac{2}{9} &= \quad \frac{4}{9} &= \quad \frac{5}{9} = \\
\frac{1}{10} &= \quad \frac{2}{10} &= \quad \frac{4}{10} &= \quad \frac{6}{10} = \\
\frac{1}{11} &= \quad \frac{2}{11} &= \quad \frac{3}{11} &= \quad \frac{4}{11} = 
\end{align*}
\]
The Terminator, part II

1) Look at all of the fractions on the previous page. List the denominators of the fractions that always terminate.

2) Look at all of the fractions on the previous page. List the denominators of the fractions that do not always terminate.

3) Convert the fractions below into decimals. Underneath each, write if it terminates or doesn’t terminate.

$$\frac{1}{12} = \quad \frac{1}{13} = \quad \frac{1}{14} = \quad \frac{1}{15} = \quad \frac{1}{16} =$$

4) Take your answers from #1 and the denominators of the terminating fraction(s) in #3, and write out each denominator in prime power representation form.

5) Take your answers from #2 and the denominators of the non-terminating fraction(s) in #3, and write out each denominator in prime power representation form.

6) Based on the fractions above and on the previous page, can we predict whether a fraction will terminate (when converted to a decimal)? If so, what are the characteristics of terminating decimal fractions?

7) What other patterns do you notice occurring in the decimal conversions on the previous page? Write those two or three that you see in the space below.