Lesson Summary

Fractions with denominators that can be expressed as products of 2’s and/or 5’s are equivalent to fractions with denominators that are a power of 10. These are precisely the fractions with finite decimal expansions.

Example:

Does the fraction \( \frac{1}{8} \) have a finite or an infinite decimal expansion?

Since \( 8 = 2^3 \), then the fraction has a finite decimal expansion. The decimal expansion is found as

\[
\frac{1}{8} = \frac{1}{2^3} = \frac{1 \times 5^3}{2^3 \times 5^3} = \frac{125}{10^3} = 0.125.
\]

If the denominator of a (simplified) fraction cannot be expressed as a product of 2’s and/or 5’s, then the decimal expansion of the number will be infinite.

Problem Set

Convert each fraction given to a finite decimal, if possible. If the fraction cannot be written as a finite decimal, then state how you know. You may use a calculator, but show your steps for each problem.

1. \( \frac{2}{32} \)

2. \( \frac{99}{125} \)

3. \( \frac{15}{128} \)

4. \( \frac{8}{15} \)

5. \( \frac{3}{28} \)

6. \( \frac{13}{400} \)

7. \( \frac{5}{64} \)

8. \( \frac{15}{35} \)

9. \( \frac{199}{250} \)

10. \( \frac{219}{625} \)