

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. $\frac{219}{625}$