MthT 430 Projects Chap8a Decimal and Binary Expansions

Given that we have worked so long on binary expansions, let's find binary expansions for some common numbers.

1. Find the decimal and binary expansions (all digits!) for

$$x = \frac{1}{3}.$$

2. Find the decimal and binary expansions (all digits!) for

$$x = \frac{1}{5}.$$

3. Find the decimal and binary expansions (all digits!) for

$$x = \frac{1}{6}.$$

4. Find the decimal and binary expansions (all digits!) for

$$x = \frac{1}{10}.$$

5. Let

$$x = \cdot_{\text{bin}} c_1 c_2 c_3 c_1 c_2 c_3 \ldots \qquad \text{(Keep repeating } c_1 c_2 c_3\text{)}$$
$$= \cdot_{\text{bin}} \overline{c_1 c_2 c_3}$$

Express x as a rational number.