Exercise 1.2

Question 1: Express the following rational numbers as decimals.
(i) 42/100 (ii) 327/500 (iii) 15/4

Solution:

(i) By long division method

100) $\overline{42}$ (0.42

400

$\overline{200}$

200

$\overline{0}$

Therefore, $\frac{42}{100}$ = 0.42

(ii) By long division method

500) $\overline{327.000}$ (0.654

3000

$\overline{2700}$

2500

$\overline{2000}$

2000

$\overline{0}$

Therefore, $\frac{327}{500}$ = 0.654

(iii) By long division method

4) $\overline{15.00}$ (3.75

12

$\overline{30}$

28

$\overline{20}$

20

$\overline{0}$

Therefore, $\frac{15}{4}$ = 3.75

Question 2: Express the following rational numbers as decimals.
(i) 2/3 (ii) –4/9 (iii) -2/15 (iv) -22/13 (v) 437/999 (vi) 33/26
Solution:

(i) Divide 2/3 using long division:

```
    0.66666
3 | 2.00000
    0
    20
    18
    20
    18
    20
    18
    20
    18
    20
    18
    2
```

$\frac{2}{3}$ = 0.666... = 0.$\overline{6}$

(ii) Divide using long division: -4/9

9) $\overline{4.000}$ (0.444

3600

$\overline{4000}$

3600

$\overline{4000}$

3600

$\overline{400}$

$\dfrac{-4}{9}$ = - 0.4444... = -0.$\overline{4}$

(iii) Divide using long division: -2/15

$$
\begin{array}{r}
0.133 \\
15\overline{)2.0000} \\
15 \\
\hline
50 \\
45 \\
\hline
50 \\
45 \\
\hline
6
\end{array}
$$

$\dfrac{-2}{15}$ =-0.133 = -0.1$\overline{3}$

(iv) Divide using long division: -22/13

```
              1.69230769
       13) 22.000
           13
           ──
           90
           78
           ───
           120
           117
           ───
            30
            26
            ──
            40
            39
           ───
           100
            91
            ──
            90

            78
           ───
           120
           117
            ─
            3
```

$\dfrac{-22}{13} = -1.6923076923\ldots = -1.\overline{692307}$

(v) Divide using long division: 437/999

```
   999) 437.0000 ( 0.43743
        3996
        ─────
        3740
        2997
        ─────
        7430
        6993
        ─────
        4370
        3996
        ─────
        3740
        2997
        ─────
         743
```

$\dfrac{437}{999} = 0.43743\ldots = 0.\overline{437}$

(vi) Divide using long division: 33/26

```
        1.2692307692
 26)33.000000000
     26
     ──
      70
      52
      ───
      180
      156
      ───
      240
      234
       ──
       60
       52
       ──
       80
       78
        ───
        200
        182
        ───
        180
        156
         ──
         24
```

$$\frac{33}{26} = 1.269230769... = 1.\overline{2692307}$$

Question 3: Look at several examples of rational numbers in the form p/q (q ≠ 0), where p and q are integers with no common factors other than 1 and having terminating decimal representations. Can you guess what property q must satisfy?

Solution:

The decimal representation will be terminating, if the denominators have factors 2 or 5 or both. Therefore, p/q is a terminating decimal, when prime factorization of q must have only powers of 2 or 5 or both.