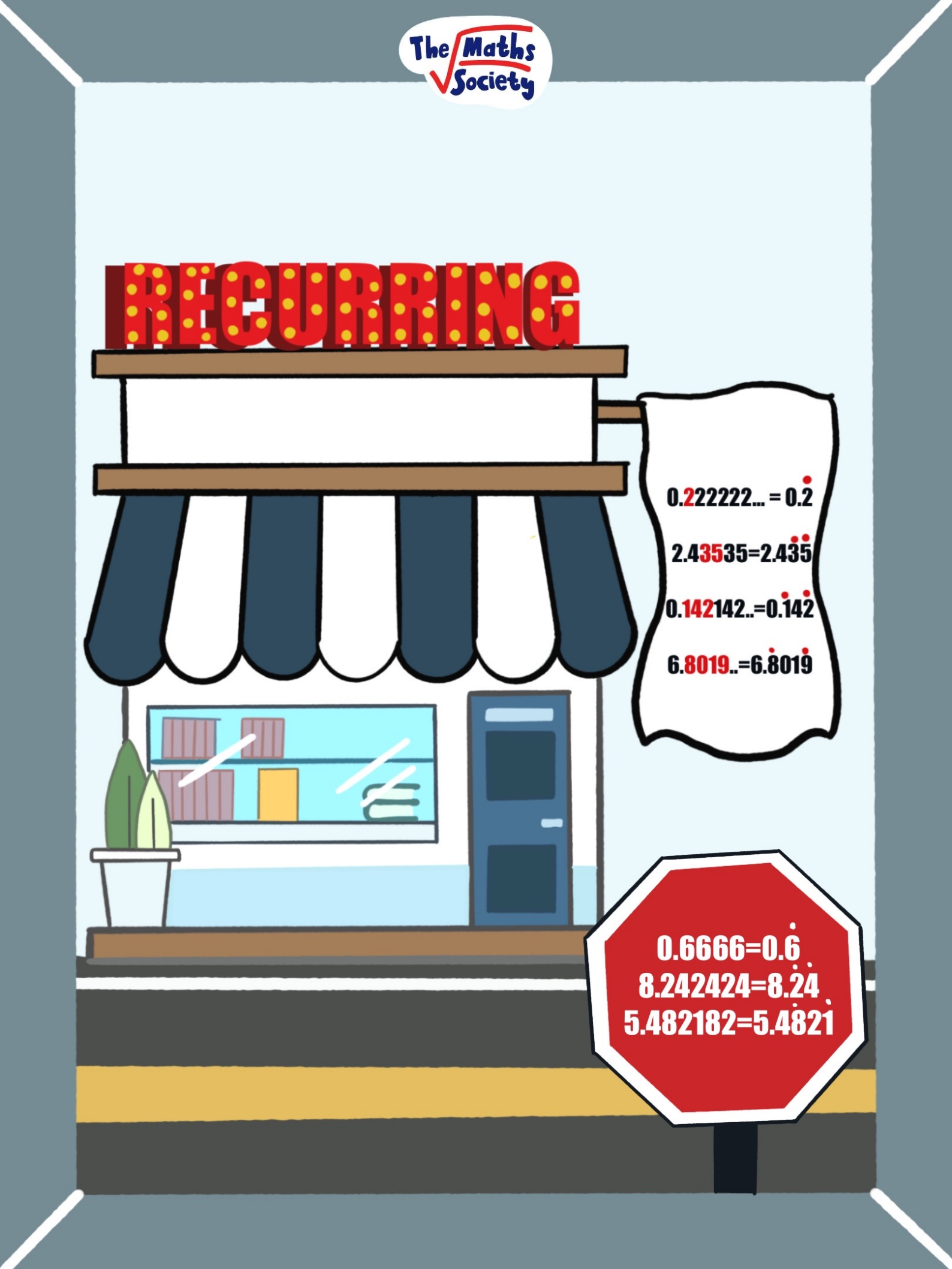
The Maths Society
RECURRING
0.222222... = 0.2̇
2.43535=2.43̇5̇
0.142142..=0.142̇
6.8019..=6.80̇19̇
0.6666=0.6̇
8.242424=8.2̇4̇
5.482182=5.48̇21̇

1. Shown below are four fractions.

$$\frac{5}{8} \quad \frac{1}{3} \quad \frac{2}{7} \quad \frac{11}{20}$$

Circle any fractions which are recurring decimals.

(2)

2. Write the fraction $\frac{1}{6}$ as a recurring decimal.

$0.1\dot{6}$

(2)

3. (a) Write $\frac{2}{3}$ as a recurring decimal.

$0.\dot{6}$

(1)

(b) Write $\frac{2}{30}$ as a recurring decimal.

$0.0\dot{6}$

(1)

4. Write $\frac{4}{7}$ as a recurring decimal.

$0.\dot{5}7142\dot{8}$

(2)

5. Write $\frac{3}{11}$ as a recurring decimal.

$0.\dot{2}\dot{7}$

(2)

6. Circle the largest number.

$1.\dot{8}\dot{5}$ $1.85\dot{}$ 1.85 1.8

(1)

7. Circle the smallest number.

$0.\dot{7}$ $0.78\dot{}$ 0.775 $0.74\dot{9}$

(1)

8. Write the following numbers in order of size, starting with the smallest.

$0.\dot{7}0\dot{5}$ $0.705\dot{}$ 0.705 $0.70\dot{5}$

$0.705, 0.\dot{7}0\dot{5}, 0.705\dot{}, 0.\dot{7}05\dot{}$

(2)

9. Write $0.\dot{8}\dot{1}$ as a fraction.
Give your answer in its simplest form.

Let $x = 0.8181...$

$100x = 81.8181...$

$99x = 81$

$x = \frac{9}{11}$

(3)

10. Convert $0.3\dot{4}$ to a fraction.
Give your answer in its simplest form.

Let $x = 0.3444....$

$10x = 3.4444...$

$9x = 3.1$

$x = \frac{31}{90}$

(3)

11. Prove algebraically that $0.5\dot{1}\dot{2}$ can be written as $\frac{169}{330}$

$x = 0.5121212...$

$100x = 51.2121212...$

$99x = 50.7$

$x = \frac{169}{330}$ (shown)

(3)

12. Convert $0.451515151...$ to a fraction.
Give your answer in its simplest form.

$x = 0.45151515...$

$100x = 45.15151515...$

$99x = 44.7$

$x = \frac{149}{330}$

.....

(3)

13. Write $1.2\dot{4}$ as a mixed number.
Give your answer in its simplest form.

$x = 1.244...$

$10x = 12.444...$

$9x = 11.2$

$x = \frac{56}{45} = 1\frac{11}{45}$

.....

(3)

14. Prove algebraically that $0.3\dot{0}\dot{9}$ can be written as $\frac{17}{55}$

$x = 0.30909\ldots$

$100x = 30.90909\ldots$

$99x = 30.6$

$x = \frac{17}{55}$ (shown)

(3)

15. Prove algebraically that $0.21\dot{6}$ can be written as $\frac{13}{60}$

$x = 0.2166\ldots$

$100x = 21.6666\ldots$

$99x = 21.45$

$x = \frac{13}{60}$ (shown)

(3)

16. Write $2.16\dot{5}$ as a mixed number.
Give your answer in its simplest form.

$x = 2.16565\ldots$

$100x = 216.565\,65\ldots$

$99x = 214.4$

$x = \frac{1072}{495} = 2\frac{82}{495}$

.....

(3)

17. Write the numbers below in order.
Start with the smallest.

$\frac{11}{23}$ $0.47\dot{2}\dot{}$ $\frac{5}{11}$

$\downarrow$

0.47826 $0.4\dot{5}\dot{}$

$5/11 , 0.47\dot{2}\dot{}, 11/23$

.....

(3)

18. Work out $0.\dot{3} - 0.0\dot{5}$

Give your answer as a fraction in its simplest form.

$x = 0.33...$

$10x = 3.33...$

$9x = 3$

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

$x = 0.0555...$

$10x = 0.5555...$

$9x = 0.5$

$x = \frac{1}{18}$

$\frac{1}{3} - \frac{1}{18} = \frac{6-1}{18}$

$= \frac{5}{18}$

.....

(4)

19. Work out $0.1\dot{4} + 0.\dot{2}\dot{3}$

Give your answer as a fraction in its simplest form.

$x = 0.144\ldots$

$10x = 1.444\ldots$

$9x = 1.3$

$x = \frac{13}{90}$

$x = 0.2323\ldots$

$100x = 23.2323\ldots$

$99x = 23$

$x = \frac{23}{99}$

$\frac{13}{90} + \frac{23}{99} = \frac{373}{990}$

$\frac{373}{990}$

(4)