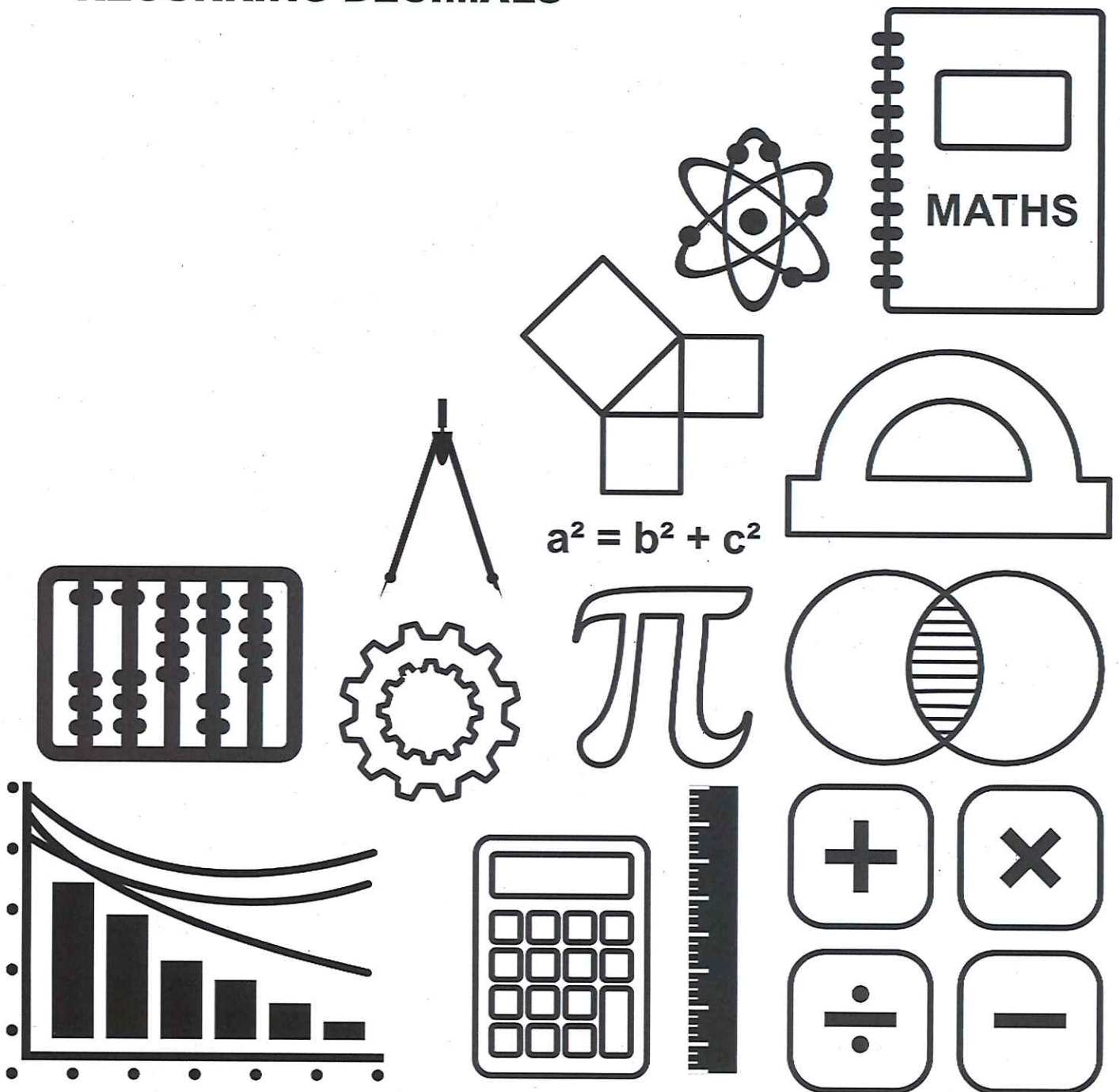


# MATHSDIY

## GCSE TOPIC BOOKLET RECURRING DECIMALS

SOLUTIONS



1. Complete the following table.

Fraction	Decimal	Recurring or terminating?
$\frac{1}{3}$	0.3	recurring
$\frac{5}{8}$	<u>0.625</u>	<u>terminating</u>
$\frac{3}{11}$	<u>0.27</u>	<u>recurring</u>
$\frac{11}{20}$	<u>0.55</u>	<u>terminating</u>

$$\frac{5}{8} = 8 \overline{) 5.0000} \begin{array}{r} 0.625 \\ 50 \\ 40 \\ 00 \end{array}$$

$$\frac{3}{11} = 11 \overline{) 3.0000} \begin{array}{r} 0.2727... \\ 22 \\ 80 \\ 80 \\ 00 \end{array}$$

$$\frac{11}{20} = 20 \overline{) 11.0000} \begin{array}{r} 0.55 \\ 110 \\ 000 \end{array}$$

(4)

2. Complete the following table.

Fraction	Decimal	Recurring or terminating?
$\frac{2}{3}$	0.6	recurring
<u><math>\frac{15}{100}</math></u> ( <u><math>\frac{3}{20}</math></u> )	0.15	<u>terminating</u>
$\frac{7}{11}$	<u>0.63</u>	<u>recurring</u>
$\frac{1}{9}$	<u>0.1</u>	<u>recurring</u>

$$0.15 = \frac{15}{100} \xrightarrow{\div 5} \frac{3}{20}$$

$$\frac{7}{11} = 11 \overline{) 7.0000} \begin{array}{r} 0.6363... \\ 77 \\ 00 \\ 00 \end{array}$$

$$\frac{1}{9} = 9 \overline{) 1.0000} \begin{array}{r} 0.111... \\ 90 \\ 1000 \end{array}$$

(4)

3. Express  $0.\overline{83}$  as a fraction.

Let  $x = 0.838383\dots$

$100x = 83.838383\dots$

Subtracting gives

$99x = 83 \quad (\div 99)$

$x = \frac{83}{99}$

(2)

4. Express  $0.6\overline{24}$  as a fraction.

Let  $x = 0.6242424\dots$

$100x = 62.4242424\dots$

Subtracting gives

$99x = 61.8 \quad (\div 99)$

$x = \frac{61.8}{99} \overset{\times 10}{=} \frac{618}{990} = \frac{618}{990}$

If you then cancel  $\div 3$

$\frac{618}{990} = \frac{309}{445} \overset{\div 3}{=} \frac{103}{165}$

(you don't have to simplify) (2)

5. Express  $0.34\overline{27}$  as a fraction.

Let  $x = 0.34272727\dots$

$100x = 34.27272727\dots$

subtracting gives

$99x = 33.93 \quad (\div 99)$

$x = \frac{33.93}{99} \overset{\times 100}{=} \frac{3393}{9900} \overset{\div 9}{=} \frac{377}{1100}$

(2)



6. Express  $0.\overline{381}$  as a fraction.

$$\text{Let } x = 0.\overline{3818181} \dots$$

$$100x = 38.\overline{1818181} \dots$$

Subtracting gives

$$99x = 37.\overline{8} \quad (\div 99)$$

$$x = \frac{37.\overline{8}}{99} = \frac{378}{990} \begin{array}{l} \div 18 \\ \hline 21 \\ \div 18 \\ \hline 55 \end{array}$$

(2)

7. Express  $0.\overline{37}$  as a fraction.

$$\text{Let } x = 0.\overline{373737} \dots$$

$$100x = 37.\overline{373737} \dots$$

Subtracting gives

$$99x = 37 \quad (\div 99)$$

$$x = \frac{37}{99}$$

(2)

8. Express  $0.\overline{825}$  as a fraction.

$$\text{Let } x = 0.\overline{8252525}$$

$$100x = 82.\overline{5252525}$$

Subtracting gives

$$99x = 81.\overline{7} \quad (\div 99)$$

$$x = \frac{81.\overline{7}}{99} = \frac{817}{990}$$

(2)

9. Express  $0.0\overline{51}$  as a fraction.

Let  $x = 0.0515151\dots$

$100x = 5.1515151\dots$

Subtracting gives

$99x = 5.1 \quad (\div 99)$

$x = \frac{5.1}{99} = \frac{51}{990} = \frac{17}{330}$

$\div 3$

(2)

10. Express  $0.2\overline{74}$  as a fraction.

Let  $x = 0.2744444\dots$

$100x = 27.444444\dots$

Subtracting gives

$99x = 27.17 \quad (\div 99)$

$x = \frac{27.17}{99} = \frac{2717}{9900} = \frac{247}{900}$

$\div 11$

(2)

11. Express  $0.1\overline{43}$  as a fraction.

Let  $x = 0.1434343\dots$

$100x = 14.343434\dots$

Subtracting gives

$99x = 14.2 \quad (\div 99)$

$x = \frac{14.2}{99} = \frac{142}{990} = \frac{71}{495}$

$\div 2$

(2)