



# Recurring Decimals to Fractions



← REVISE THIS TOPIC

1 Express  $0.\dot{5}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 10x = 5.5555\dots \\
 x = 0.5555\dots \\
 \hline
 9x = 5 \\
 x = \frac{5}{9}
 \end{array}$$

$$\frac{5}{9}$$

(Total for Question 1 is 2 marks)

2 Express  $0.\dot{7}\dot{1}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 100x = 71.717171\dots \\
 x = 0.717171\dots \\
 \hline
 99x = 71 \\
 x = \frac{71}{99}
 \end{array}$$

$$\frac{71}{99}$$

(Total for Question 2 is 2 marks)



- 3 Express  $0.\dot{4}\dot{5}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 100x = 45.454545\dots \\
 x = 0.454545\dots \\
 \hline
 99x = 45 \\
 x = \frac{45}{99}
 \end{array}$$

$$\frac{45}{99} = \frac{5}{11}$$

$$\frac{5}{11}$$

(Total for Question 3 is 3 marks)

- 4 Express  $0.\dot{2}\dot{1}\dot{4}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 1000x = 214.214214\dots \\
 x = 0.214214\dots \\
 \hline
 999x = 214 \\
 x = \frac{214}{999}
 \end{array}$$

$$\frac{214}{999}$$

(Total for Question 4 is 3 marks)

- 5 Express  $0.\dot{3}\dot{2}\dot{4}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 1000x = 324.324324\dots \\
 x = 0.324324\dots \\
 \hline
 999x = 324 \\
 x = \frac{324}{999}
 \end{array}$$

$$\frac{324}{999} = \frac{36}{111} = \frac{12}{37}$$

$$\frac{12}{37}$$

(Total for Question 5 is 3 marks)



- 6 Express  $0.5\dot{3}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 100x = 53.333333 \\
 - 10x = 5.333333 \dots \\
 \hline
 x = 0.533333 \dots \\
 \hline
 90x = 48 \\
 x = \frac{48}{90}
 \end{array}
 \qquad
 \frac{48}{90} = \frac{8}{15}
 \qquad
 \frac{8}{15}$$

(Total for Question 6 is 3 marks)

- 7 Express  $0.12\dot{4}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 1000x = 124.444444 \dots \\
 - 100x = 12.444444 \dots \\
 \hline
 x = 0.124444 \dots \\
 \hline
 900x = 112 \\
 x = \frac{112}{900}
 \end{array}
 \qquad
 \frac{112}{900} = \frac{28}{225}
 \qquad
 \frac{28}{225}$$

(Total for Question 7 is 3 marks)

- 8 Express  $0.4\dot{2}\dot{3}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 1000x = 423.232323 \dots \\
 - 10x = 4.232323 \dots \\
 \hline
 x = 0.423232 \dots \\
 \hline
 990x = 419 \\
 x = \frac{419}{990}
 \end{array}
 \qquad
 \frac{419}{990}$$

(Total for Question 8 is 3 marks)



9 Express  $0.0\dot{3}\dot{8}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 1000x = 38.383838383\dots \\
 - 10x = 0.383838383\dots \\
 \hline
 x = 0.038383838\dots \\
 \hline
 990x = 38 \\
 x = \frac{38}{990}
 \end{array}$$

$$\frac{38}{990} = \frac{19}{495}$$

$$\frac{19}{495}$$

(Total for Question 9 is 3 marks)

10 Express  $3.\dot{6}\dot{2}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 100x = 362.62626262\dots \\
 x = 3.62626262\dots \\
 \hline
 99x = 359 \\
 x = \frac{359}{99}
 \end{array}$$

$$\frac{359}{99}$$

(Total for Question 10 is 3 marks)

11 Express  $0.3\dot{1}6\dot{1}$  as a fraction in its simplest form.  
You must show all your working.

$$\begin{array}{r}
 10000x = 3161.161161161\dots \\
 - 10x = 3.161161161\dots \\
 \hline
 x = 0.3161161161\dots \\
 \hline
 9990x = 3158 \\
 x = \frac{3158}{9990}
 \end{array}$$

$$\frac{3158}{9990} = \frac{1579}{4995}$$

$$\frac{1579}{4995}$$

(Total for Question 11 is 3 marks)



12 Work out  $0.\dot{6}\dot{8} - 0.\dot{2}\dot{7}$   
 You must show all your working.  
 Give your answer as a fraction in its simplest form.

$$\begin{aligned}
 100x &= 68.88888 \dots \\
 10x &= 6.88888 \dots \\
 x &= 0.68888 \dots \\
 \hline
 90x &= 62 \\
 x &= \frac{62}{90}
 \end{aligned}$$

$$\begin{aligned}
 100y &= 27.77777 \dots \\
 10y &= 2.77777 \dots \\
 y &= 0.27777 \dots \\
 \hline
 90y &= 25 \\
 y &= \frac{25}{90}
 \end{aligned}$$

$$\frac{62}{90} - \frac{25}{90} = \frac{37}{90}$$

$$\frac{37}{90}$$

(Total for Question 12 is 5 marks)

13 Work out  $0.5\dot{3} \times 0.1\dot{6}$   
 You must show all your working.  
 Give your answer as a fraction in its simplest form.

$$\begin{aligned}
 100x &= 53.33333 \dots \\
 10x &= 5.33333 \dots \\
 x &= 0.53333 \dots \\
 \hline
 90x &= 48 \\
 x &= \frac{48}{90} \quad x = \frac{24}{45}
 \end{aligned}$$

$$\begin{aligned}
 100y &= 16.66666 \dots \\
 10y &= 1.66666 \dots \\
 y &= 0.16666 \dots \\
 \hline
 90y &= 15 \\
 y &= \frac{15}{90} \quad y = \frac{1}{6}
 \end{aligned}$$

$$\frac{24}{45} \times \frac{1}{6} = \frac{4}{45}$$

$$\frac{4}{45}$$

(Total for Question 13 is 5 marks)



14 Work out  $0.0\dot{8} \div 3.\dot{6}\dot{3}$

You must show all your working.

Give your answer as a fraction in its simplest form.

$$100x = 8.88888 \dots$$

$$10x = 0.88888 \dots$$

$$x = 0.08888 \dots$$

$$90x = 8$$

$$x = \frac{8}{90}$$

$$\frac{\overset{1}{8}}{\underset{10}{90}} \times \frac{\overset{11}{99}}{\underset{45}{360}} = \frac{11}{450}$$

$$100y = 363.636363 \dots$$

$$10y = 36.363636 \dots$$

$$- y = 3.636363 \dots$$

$$99y = 360$$

$$y = \frac{360}{99}$$

$$\frac{11}{450}$$

(Total for Question 14 is 5 marks)

15 Work out  $(0.\dot{2}9\dot{6})^{\frac{2}{3}}$

You must show all your working.

Give your answer as a fraction in its simplest form.

$$1000x = 296.296296296 \dots$$

$$x = 0.296296296 \dots$$

$$999x = 296$$

$$x = \frac{296}{999}$$

$$x = \frac{2 \times 2 \times 2 \times \cancel{37}}{3 \times 3 \times 3 \times \cancel{37}}$$

$$x = \frac{8}{27}$$

$$\left(\frac{8}{27}\right)^{\frac{2}{3}} = \left(\frac{2}{3}\right)^2$$

$$\frac{4}{9}$$

(Total for Question 15 is 5 marks)

