

FULL MODEL ANSWERS

Q1. NON-CALCULATOR

Prove that the recurring decimal $0.4\dot{3}$ has the value $\frac{13}{30}$

$$\begin{array}{r} 10n = 4.3\dot{3} \\ - \quad n = 0.4\dot{3} \\ \hline 9n = 3.90 \\ \times 10 \quad \times 10 \end{array}$$

$$90n = 39$$

$$n = \frac{39 \div 3}{90 \div 3}$$

$$n = \frac{13}{30}$$

(Total for question = 2 marks)

Q2. NON-CALCULATOR

Express $0.4\dot{1}\dot{8}$ as a fraction. You must show all your working.

$$\begin{array}{r} 100n = 41.8181\dot{8} \\ - \quad n = 0.4181\dot{8} \\ \hline 99n = 41.40000 \\ \times 10 \quad \times 10 \end{array}$$

$$990n = 414$$

$$n = \frac{414 \div 2}{990 \div 2}$$

$$= \frac{207 \div 9}{495 \div 9}$$

$$\frac{23}{55}$$

(Total for question = 3 marks)

Q3. NON-CALCULATOR

Prove algebraically that $0.2\dot{5}\dot{6}$ can be written as $\frac{127}{495}$

$$\begin{array}{r} 100n = 25.6565\dot{6} \\ - \quad n = 0.2565\dot{6} \\ \hline 99n = 25.40000 \\ \times 10 \quad \times 10 \end{array}$$

$$990n = 254$$

$$n = \frac{254 \div 2}{990 \div 2}$$

$$n = \frac{127}{495}$$

(Total for question = 3 marks)

Q4. NON-CALCULATOR

$$x = 0.4\dot{3}\dot{6}$$

$$\frac{24}{55}$$

Prove algebraically that x can be written as

$$\begin{array}{r} 100x = 43.63636 \\ - \quad x = 0.43636 \\ \hline 99x = 43.20000 \end{array}$$

$$990x = 432$$

$$x = \frac{432 \div 2}{990 \div 2}$$

$$= \frac{216 \div 9}{495 \div 9}$$

$$x = \frac{24}{55}$$

(Total for question = 3 marks)

Q5. NON-CALCULATOR

Express the recurring decimal $0.2\dot{8}\dot{1}$ as a fraction in its simplest form.

$$\begin{array}{r} 100n = 28.18181 \\ - \quad n = 0.28181 \\ \hline 99n = 27.90000 \end{array}$$

$$990n = 279$$

$$n = \frac{279 \div 9}{990 \div 9}$$

$$\frac{31}{110}$$

(Total for Question is 3 marks)

Q6. NON-CALCULATOR

Write $0.6\dot{2}\dot{4}$ as a fraction in its simplest form.

$$\begin{array}{r} 100n = 62.42424 \\ - \quad n = 0.62424 \\ \hline 99n = 61.80000 \end{array}$$

$$n = \frac{618 \div 2}{990 \div 2}$$

$$= \frac{309 \div 3}{495 \div 3}$$

$$\frac{103}{165}$$

(Total for question = 3 marks)

Q7. NON-CALCULATOR

Express the recurring decimal $0.7\dot{5}\dot{0}$ as a fraction.

$$\begin{array}{r}
 100n = 75.05050 \\
 n = 0.75050 \\
 \hline
 99n = 74.30000 \\
 n = \frac{74.3 \times 10}{99 \times 10} \\
 = \frac{743}{990}
 \end{array}$$

$$\frac{743}{990}$$

(Total for Question is 3 marks)

Q8. CALCULATOR ALLOWED

Prove algebraically that the recurring decimal $0.3\dot{1}\dot{8}$ can be written as $\frac{7}{22}$

$$\begin{aligned}
 100n &= 31.81818 \\
 - \quad n &= 0.31818 \\
 \hline
 99n &= 31.50000 \times 10 \\
 990n &= 315 \\
 n &= \frac{315}{990} \div 45 \\
 n &= \frac{7}{22}
 \end{aligned}$$

(Total for question = 2 marks)

Q9. CALCULATOR ALLOWED

Prove algebraically that the recurring decimal $0.4\dot{5}\dot{7}$ can be written as $\frac{151}{330}$

$$\begin{aligned}
 100n &= 45.75757 \\
 - \quad n &= 0.45757 \\
 \hline
 99n &= 45.30000 \times 10 \\
 990n &= 453 \\
 n &= \frac{453}{990} \div 3 \\
 n &= \frac{151}{330}
 \end{aligned}$$

(Total for question = 3 marks)

Q10. CALCULATOR ALLOWED

Using algebra, prove that $0.1\dot{3}\dot{6} \times 0.\dot{2}$ is equal in value to $\frac{1}{33}$

$$\begin{aligned}
 100n &= 13.63636 \\
 - \quad n &= 0.13636 \\
 \hline
 99n &= 13.5 \times 10 \\
 990n &= 135 \\
 n &= \frac{135}{990} \div 45 \\
 n &= \frac{3}{22}
 \end{aligned}$$

$$\begin{aligned}
 10p &= 2.22 \\
 - \quad p &= 0.22 \\
 \hline
 9p &= 2 \\
 p &= \frac{2}{9}
 \end{aligned}$$

$$\begin{aligned}
 n \times p &= \frac{3}{22} \times \frac{2}{9} \\
 &= \frac{6}{198} \div 6 \\
 &= \frac{1}{33}
 \end{aligned}$$

(Total for question = 3 marks)