Recurring Decimals and Rational Numbers

GCSE Mathematics • **Higher Tier** • Grades 7–8 • Non-calculator

Name: _____ Class: _____ Total: _____ / 61

Show all your working. Marks are given for correct method as well as the final answer.

1. Write $0.\dot{3}$ as a fraction. **[2 marks]**

Answer: _____

2. Write $0.\dot{7}$ as a fraction. **[2 marks]**

Answer: _____

3. Write $0.\dot{4}\dot{5}$ as a fraction in its simplest form. **[3 marks]**

Answer: _____

4. Write $0.\dot{2}\dot{7}$ as a fraction in its simplest form. **[3 marks]**

Answer: _____

5. Write $0.\dot{1}2\dot{3}$ as a fraction in its simplest form. **[3 marks]**

Answer: _____

6. Write $0.1\dot{6}$ as a fraction in its simplest form. **[4 marks]**

Answer: _____

7. Write $0.2\dot{7}$ as a fraction in its simplest form. **[4 marks]**

Answer: _____

8. Write $0.4\dot{1}\dot{6}$ as a fraction in its simplest form. **[4 marks]**

Answer: _____

9. Write $1.\dot{6}$ as a mixed number in its simplest form. **[3 marks]**

Answer: _____

10. Write $2.\dot{3}\dot{6}$ as a mixed number in its simplest form. **[4 marks]**

Answer: _____

11. Write $\frac{5}{9}$ as a recurring decimal. **[2 marks]**

Answer: _____

12. Write $\frac{4}{11}$ as a recurring decimal. **[2 marks]**

Answer: _____

13. Write $\frac{7}{12}$ as a decimal. **[2 marks]**

Answer: _____

14. Explain how you can tell from its denominator that $\frac{3}{8}$ terminates. **[3 marks]**

Answer: _____

15. Explain why $\frac{5}{6}$ recurs. **[2 marks]**

Answer: _____

16. Write down whether $\frac{9}{40}$ terminates or recurs, with a reason. **[2 marks]**

Answer: _____

17. Explain why every recurring decimal is a rational number. **[2 marks]**

Answer: _____

18. Write down whether $\sqrt{9}$ is rational, with a reason. **[2 marks]**

Answer: _____

19. Prove that $0.\dot{9} = 1$.

(a) Use the algebraic method. **[3 marks]**

(b) Write down what this shows about decimal representations. **[2 marks]**

Answer: _____

20. $x = 0.\dot{2}\dot{4}$ and $y = 0.\dot{1}\dot{2}$.

(a) Write x and y as fractions in their simplest form. **[4 marks]**

(b) Work out $x - y$ as a fraction in its simplest form. **[3 marks]**

Answer: _____

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