Higher Tier Questions

Recurring Decimals to Fractions

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Q1.

Prove algebraically that the recurring decimal $0.2\dot{5}$ has the value $\dfrac{23}{90}$

$$\text{Let } x = 0.2555\dot{5}$$
$$10x = 2.555\dot{5} \quad \textcircled{1}$$
$$100x = 25.555\dot{5} \quad \textcircled{2}$$

(Total for question = 2 marks)

$\textcircled{2} - \textcircled{1}$
$$90x = 23$$
$$x = \frac{23}{90}$$

$$\therefore \quad 0.2\dot{5} = \frac{23}{90}$$

Q2.

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

$$\text{Let } x = 0.31818\dot{1}\dot{8}$$
$$10x = 3.18\dot{1}\dot{8} \quad \textcircled{1}$$
$$1000x = 318.18\dot{1}\dot{8} \quad \textcircled{2}$$

(Total for question = 2 marks)

$\textcircled{2} - \textcircled{1}$
$$990x = 315$$
$$x = \frac{315}{990} = \frac{63}{198} = \frac{7}{22}$$

$$\therefore \quad 0.3\dot{1}\dot{8} = \frac{7}{22}$$