Mark Scheme

Q1.

PAPER: 5MB3H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
		$\frac{59}{330}$	3	M1 for $100x = 17.87878787\ldots$ or $1000x = 178.7878787\ldots$ **and** $10x = 1.7878787$ M1 (dep) for subtraction, $100x - x$ or $1000x - 10x$ or $\frac{17.7}{99}$ or $\frac{177}{990}$ seen A1 working leading to given fraction

Q2.

Question		Working	Answer	Mark	Notes
		$0.\dot{2}5$ = 0.2555... 0.25555...×10 = 2.5555... 0.25555...×100 = 25.5555... 25.5555... – 2.5555... = 23 **Alternative Method** x = 0.25555 ... $10x$ = 2.5555 ... $100x$ = 25.5555... $90x$ = 23	$^{23}/_{90}$	3	M1 for 0.25555... or 0.2 + 0.05555... M1 for two correct recurring decimals that, when subtracted, would result a terminating decimal, and attempting the subtraction or $^{2.3}/_{9}$ or $^{253}/_{990}$ A1 cao **Alternative Method** M1 for x = 0.25555... M1 for two correct recurring decimals that, when subtracted, would result a terminating decimal, e.g. $10x$ = 2.5555..., $100x$ = 25.5555... and attempting the subtraction or $9x = 2.3$ or $90x = 23$ or $900x = 230$ or $^{2.3}/_{9}$ or $^{253}/_{990}$ A1 cao SC: B1 for fraction with denominator 90 if M0

Q3.

Question		Working	Answer	Mark	Notes
		eg. $x = 0.28181\ldots$ $100x = 28.181\ldots$ $99x = 27.9$	$\frac{31}{110}$	3	M1 for 0.28181(...) **or** 0.2 + 0.08181(...) **or** evidence of correct recurring decimal eg. 281.81(...) M1 for two correct recurring decimals that, when subtracted, would result in a terminating decimal, and attempting the subtraction eg. $100x = 28.1818\ldots$, $x = 0.28181\ldots$ and subtracting eg. $1000x = 281.8181\ldots$, $10x = 2.8181\ldots$ and subtracting **OR** $\frac{27.9}{99}$ or $\frac{279}{990}$ oe A1 cao

Q4.

Question	Working	Answer	Mark	Notes
		Proof	M1	for a fully complete method as far as finding two correct decimals that, when subtracted, give a terminating decimal (or integer) and showing intention to subtract, e.g. $9x = 3.9$
			A1	correct working to conclusion

Q5.

Question		Working	Answer	Mark	Notes
			$\frac{103}{165}$	3	M1 for method to find 2 multiples of 0.624 that can be used to eliminate the decimals M1 for complete method A1 cao

Q6.

Question	Working	Answer	Mark	Notes
		Proof to reach $\frac{24}{55}$	M1 M1 A1	for $100x = 43.636\ldots$ $(43.\dot{6}\dot{3})$ **or** $10x = 4.3636\ldots$ $(4.\dot{3}\dot{6})$ and $1000x = 436.36\ldots.(436.\dot{3}\dot{6})$ (dep) for finding difference that would lead to a terminating decimal for completing algebra to reach $\frac{24}{55}$

Q7.

Question	Working	Answer	Mark	Notes
			M1 M1 C1 M1 M1 C1	for the start of a method to convert 0.22.. to a fraction, eg$10y = 2.22..$ or $(y=)\frac{2}{9}$ for the start of a method to convert 0.13636... to a fraction, $10x = 1.3636..$ or $100x = 13.6363\ldots$ or $1000x = 136.3636..$ or $(x=)\frac{13.5}{99}$ or $(x=)\frac{135}{990}$ for correct arithmetic and concluding the proof OR for $0.1\dot{3}\dot{6} \times 0.\dot{2} = 0.\dot{0}\dot{3}$ $(=z)$ for complete method to find two appropriate recurring decimals the difference of which is a rational number, eg. $100z = 3.0303\ldots$,$(z=)$ $0.0303\ldots$ or $\frac{3}{99}$ for correct arithmetic and concluding the proof

Q8.

		Working	Answer	Mark	Notes
		$x = 0.7505050\ldots$ $10x = 7.505050\ldots$ $1000x = 750.505050\ldots$ $990x = 743$ OR $100x = 75.0505050\ldots$ $99x = 74.3$	$^{743}/_{990}$	3	M1 for 0.75050(50….) or 0.7 + 0.050(5050….) M1 (dep) for two recurring decimals that, when subtracted, leave a terminating decimal A1 for $^{743}/_{990}$

Q9.

Question	Working	Answer	Mark	Notes
		0.246, $0.\dot{2}4\dot{6}$ $0.2\dot{4}\dot{6}$, $0.24\dot{6}$	M1	for correct use of recurring symbol eg $0.2\dot{4}\dot{6}$ = 0.24646… **or** 3 terms in the correct relative position
			A1	cao