

Question number	Scheme	Marks
9	$\frac{2^{4x}}{2^{3y}} = \frac{1}{2^2}$ $2^{4x-2y} = 2^{-2} \quad (\rightarrow 4x-3y = -2)$ $2^{2x}2^y = 2^4$ $2^{2x+y} = 2^4 \quad \rightarrow (2x+y = 4)$ <p>A fully correct method using for solving simultaneously leading to either $10x = 10$ or $5y = 10$</p> $4x-3y = -2 \Rightarrow 10x = 10 \text{ or } 4x-3y = -2 \Rightarrow 5y = 10$ $6x+3y = 12 \qquad \qquad \qquad 4x+2y = 8$ $y = 2$ $x = 1$	<p>M1</p> <p>dM1</p> <p>M1</p> <p>dM1</p> <p>ddddM1</p> <p>A1</p> <p>A1</p> <p>[7]</p>
	<p>Alternative Method</p> $4^x = \frac{16}{2^y}$ $\frac{4^{2x}}{8^y} = \frac{1}{4}$ $\left(\frac{16}{2^y}\right)^2 \times \frac{1}{8^y} = \frac{1}{4}$ $8^y \times 2^{2y} = 4 \times 16^2$ $2^{3y} \times 2^{2y} = 2^2 \times 2^8$ $(2^{5y} = 2^{10}) \quad y = 2$ $(4^x \times 4 = 16) \quad x = 1$	<p>M1</p> <p>M1</p> <p>ddM1</p> <p>dddM1</p> <p>ddddM1</p> <p>A1</p> <p>A1</p>

Part	Mark	Additional Guidance
(a)	M1	For correctly changing any two indices into powers of 2 and simplifying. Accept any two of 2^2 or 2^{4x} or 2^{3y}
	dM1	Dependent on previous method mark. A fully correct method using index laws to simplify their expressions as powers of 2 and an attempt to write this as a linear equation.
	M1	For correctly changing both indices to powers of 2, as shown
	dM1	Dependent on previous method mark. A fully correct method using index laws to simplify their expressions as powers of 2 and an attempt to write this as a linear equation.
	ddddM1	Dependent on all previous method marks
	A1	$y = 2$
	A1	$x = 1$
ALT	M1	For a correct rearrangement of the 2 nd equation as shown
	M1	For converting the 16^x into 4^{2x} as shown.
	ddM1	Dependent on both previous method marks. Substitution of $\frac{16}{2^y}$ into the second equation, this need not be fully simplified.
	dddM1	Dependent on all previous method marks. An attempt to rearrange the equation, must have at least one side of the equation shown correct.
	ddddM1	Dependent on all previous method marks. An attempt to convert all into powers of 2, must see at least 2 of 2^{3y} , 2^{2y} , 2^2 , 2^8 correctly written.
	A1	$y = 2$
	A1	$x = 1$