Question			Answer	Marks	AO	Guidance
7	(a)					NB Other correct methods may be seen
			$(3m+0)^2 = 9m^2$	B1	3.1a	$9m^2$ alone, not as part of longer expression
			$(3m+1)^2$ $= 9m^2 + 6m + 1$ $= 3(3m^2 + 2m) + 1$ | $(3m+2)^2$ $= 9m^2 + 12m + 4$ $= 3(3m^2 + 4m + 1) + 1$ or $3(3m^2 + 4m) + 4$	M1	1.1	At least one of these expansions attempted using $r = 1$ or 2. Must include three (or four) terms, Allow one error
				A1	2.1	At least one of these seen explicitly
			None of these is of the form $3n + 2$ Allow "$\neq 3n + 2$"	A1	3.2a	Must see the statement oe. Can be seen once at end or with each separate case Dep complete method, with all three cases seen
				[4]		
			Alternative method 1			
			$(3m+r)^2$ $(= 9m^2 + 6mr + r^2)$	M1		Attempted. Must include 3 (or 4) terms, Allow one error
			$= 3(3m^2 + 2mr) + r^2$ $= 3n + r^2$	A1		Explicit
			But $r^2 = 0$, 1 or 4	B1		
			Hence not in the form $3n + 2$ for any r	A1		Must see the statement oe Dep complete method
			Alternative method 2			
			Let $(3m+r)^2 = 3n + 2$	M1		
			$3(3m^2 + 2mr - n) = 2 - r^2$	A1		
			Hence $2 - r^2$ is divisible by 3	B1		
			But $2 - 0^2 = 2$, $2 - 1^2 = 1$, $2 - 2^2 = -2$ None of these is divisible by 3	A1		

Question			Answer	Mark	AO	Guidance
7	(a)	ctd	**Alternative method 3**			
			$(3m)^2 = (9m^2 - 2) + 2$	B1		
			$(3m + 1)^2 = (9m^2 + 6m - 1) + 2$	M1		Allow one arithmetical error
			$(3m + 2)^2 = (9m^2 + 12m + 2) + 2$	A1		Both correct
			$(9m^2 - 2) = 3(3m^2) - 2$			or $3(3m^2 - \frac{2}{3}) + 2$
			$(9m^2 + 6m - 1) = 3(3m^2 + 2m) - 1$			or $3(3m^2 + 2m - \frac{1}{3}) + 2$
			$(9m^2 + 12m + 2) = 3(3m^2 + 4m) + 2$			or $3(3m^2 + 4m + \frac{2}{3}) + 2$
			Hence none is divisible by 3	A1		None of the brackets is an integer
7	(b)		Either implies three digits all of the same type or imply three digits all of different types	M1*	3.1a	Could be numerical or algebraic or in words If listed, must be clear which ones are selected
			P(0, 0, 0) or P(1, 1, 1) or P(2, 2, 2): $\left(\frac{1}{3}\right)^3$	M1 dep	1.1	M1 for $\left(\frac{1}{3}\right)^3$ associated with at least one of these
			P(0, 1, 2): $\left(\frac{1}{3}\right)^3 \times 6$ or $1 \times \frac{2}{3} \times \frac{1}{3}$ oe	M1 dep	2.1	M1 for $\left(\frac{1}{3}\right)^3 \times k$ where $k = 4, 5$ or 6, associated with (0, 1, 2)
			Alternative method for 2nd & 3rd M1M1			
			No. of cases = $3^3 = 27$	M1		
			No. divisible by 3 = $(3 + 6 =)$ 9	M1		Allow 7 or 8
			$\frac{9}{27}$ or $\frac{1}{3}$ or 0.333 (3 sf)	A1	1.1	Correct answer with no working: M0M0M0A0

Question			Answer	Mark	AO	Guidance
				[4]		