

Q	Marking instructions	AO	Marks	Typical solution
7(a)	Substitutes $r = 2$ into given formula and writes out either $n!$ or $(n-2)!$ correctly up to at least three terms  Accept $n! = n \times (n-1) \times (n-2)!$ or $(n-2)! = (n-2) \times (n-3) \times (n-4)!$  Condone omission of brackets	1.1a	M1	${}^n C_2 = \frac{n!}{2!(n-2)!}$ $= \frac{n \times (n-1) \times (n-2) \times \dots}{2 \times (n-2) \times \dots}$ $= \frac{n(n-1)}{2}$
	Completes reasoned argument, eliminating common factors correctly leading to the correct form  Must see $\frac{n \times (n-1)}{2}$ <b>AG</b>	2.1	R1	
7(b)(i)	Simplifies to obtain ${}^n C_4$ as $\frac{2n(n-1)(n-2)(n-3)}{4!}$ or better	1.1b	B1	$2 \times {}^n C_4 = 51 \times {}^n C_2$ $\frac{2n!}{4!(n-4)!} = \frac{51n(n-1)}{2}$
	Writes ${}^n C_4$ and ${}^n C_2$ in terms of $n$ and forms an equation using $2 \times {}^n C_4 = 51 \times {}^n C_2$  Allow ${}^n C_4 = \frac{2n!}{4!(n-4)!}$ or $\frac{2n(n-1)(n-2)(n-3)}{4!}$ or  ${}^n C_2 = \frac{n!}{2!(n-2)!}$	3.1a	M1	$\frac{2n(n-1)(n-2)(n-3)}{4!} = \frac{51 \times n \times (n-1)}{2}$ $\frac{(n-2)(n-3)}{6} = 51$ $n^2 - 5n + 6 = 306$ $n^2 - 5n - 300 = 0$

	<p>Completes reasoned argument to obtain given result</p> <p>Must see <math>\frac{(n-2)(n-3)}{6} = 51</math> or</p> <p><math>(n-2)(n-3) = 306</math> <b>OE</b> <b>AG</b></p>	2.1	R1	
<b>7(b)(ii)</b>	<p>Obtains at least one correct solution to the equation</p> $n^2 - 5n - 300 = 0$ <p><b>PI</b> by correct answer</p>	1.1a	M1	$n = -15$ or $20$ since $n > 0$ , so $n = 20$
	States $n = 20$	3.2a	A1	
	<b>Total</b>		<b>7</b>	