

## (41) Binomial Expansion (Factorial Notation)

### WORKING AT D/E

(1) Without a calculator, find the value of  $5!$

(2) Without a calculator, show that  $\binom{5}{3} = 10$

(3) Given that  $\binom{4}{r} = 4$ , find the possible values of  $r$ .

### WORKING AT B/C

(1) Given that  $\binom{18}{m} = \frac{18!}{3!}$  write down the possible values of  $m$ .

(2) Simplify  $n(n-1)!$

(3) Given that  $\binom{16}{5} = 4368$ , write down the value of  $n$  such that  $\binom{16}{n} = 4368$ ,  $n \neq 5$ .

### WORKING AT A\*/A

(1) Show, with full workings, that  $\binom{n}{1} = n$

(2) Show, with full workings, that

$$\binom{n}{3} = \frac{n^3 - 3n^2 + 2n}{6}$$