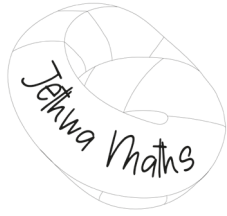


# A-Level Starter Activity



**Topic: Factorial Notation**

Chapter Reference: Pure 1, Chapter 8

**5**

**minutes**

1. Given that  $\binom{50}{13} = \frac{50!}{13! a!}$ , write down the value of a

(2)

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2. Given that  $\binom{35}{p} = \frac{35!}{p! 18!}$ , write down the value of p.

(2)

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3. Given that  $\binom{45}{17} = \frac{45!}{17! a!}$ , write down the value of a.

(2)

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## Solutions

1.

$\binom{50}{13} = \frac{50!}{13! 37!}$	<b>M1</b>
$a = 37$	<b>M1</b>

2.

$\binom{35}{17} = \frac{35!}{17! 18!}$	<b>M1</b>
$p = 17$	<b>M1</b>

3.

$\binom{45}{17} = \frac{45!}{17! 28!}$	<b>M1</b>
$a = 28$	<b>M1</b>





## Solutions

1.

$(1 + \frac{1}{2})^{10} = 1 + \binom{10}{1}(\frac{1}{2}x) + \binom{10}{2}(\frac{1}{2}x)^2 + \binom{10}{3}(\frac{1}{2}x)^3$	<b>M1</b>
$= 1 + 5x + \frac{45}{4}x^2 + 15x^3$	<b>M1</b>

2.

$(1.005)^{10} = (1 + \frac{1}{2} \times 0.01)^{10}$	<b>M1</b>
$= 1 + 5(0.01) + \frac{45}{4}(0.01)^2 + 15(0.01)^3$	<b>M1</b>
$= 1 + 0.05 + 0.001125 + 0.000015$	<b>M1</b>
$= 1.05114$	<b>M1</b>





## Solutions

1a.

$1 + 12px + \frac{12 \times 11}{2}(px)^2$	<b>M1 M1</b>
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1b.

$12p(x) = -q(x)$ $66p^2(x^2) = 11q(x^2)$	<b>M1</b>
$66p^2 = -132p$	<b>M1</b>
$p = -2$	
$q = 24$	<b>M1</b>





## Solutions

1.

$(1 + ax)^{10} = 1 + 10ax + \frac{10 \times 9}{2} (ax)^2 + \frac{10 \times 9 \times 8}{6} (ax)^3$	<b>M1 M1</b>
$= 1 + 10ax + 45(ax)^2 + 120(ax)^3$	<b>M1 M1</b>

2.

$120a^3 = 2 \times 45a^2$	<b>M1</b>
$a = \frac{3}{4}$	<b>M1</b>

