



CRACK THE SAFE

THE BINOMIAL EXPANSION



$$(a + b)^n = a^n + \binom{n}{1}a^{n-1}b + \binom{n}{2}a^{n-2}b^2 + \dots + \binom{n}{r}a^{n-r}b^r + \dots + b^n$$

$$(1 + x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \frac{n(n-1)(n-2)}{3!}x^3 + \dots + x^n$$

	The coefficient of x^2 in the expansion of $(3 + 4x)^3$	
	The coefficient of x^3 in the expansion of $(2 - 5x)^4$	
	The coefficient of x^5 in the expansion of $(1 + \frac{1}{2}x)^6$	
	The coefficient of x^3 in the expansion of $(1 - \frac{3}{4}x)^4$	
	Given that the fourth term in the expansion of $(1 + kx)^8$ is $12096x^3$, find the value of k	
	Given that the coefficient of x^4 in the binomial expansion of $(a - 3x)^5$ is 810, find the value of a	
	Given that the coefficient of x^2 in the binomial expansion of $(1 + 2x)^n$ is 760, find the positive value of n	

THE KEY CODE TO THE LOCK IS BDF - ACEG



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$$(a + b)^n = a^n + \binom{n}{1}a^{n-1}b + \binom{n}{2}a^{n-2}b^2 + \dots + \binom{n}{r}a^{n-r}b^r + \dots + b^n$$

$$(1 + x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \frac{n(n-1)(n-2)}{3!}x^3 + \dots + x^n$$

	The coefficient of x^2 in the expansion of $(3 + 4x)^3$	144
	The coefficient of x^3 in the expansion of $(2 - 5x)^4$	-1000
	The coefficient of x^5 in the expansion of $(1 + \frac{1}{2}x)^6$	$\frac{3}{16}$
	The coefficient of x^3 in the expansion of $(1 - \frac{3}{4}x)^4$	$-\frac{27}{16}$
	Given that the fourth term in the expansion of $(1 + kx)^8$ is $12096x^3$, find the value of k	6
	Given that the coefficient of x^4 in the binomial expansion of $(a - 3x)^5$ is 810, find the value of a	2
	Given that the coefficient of x^2 in the binomial expansion of $(1 + 2x)^n$ is 760, find the positive value of n	20

THE KEY CODE TO THE LOCK IS 135