Abraham de Moivre est né le 26 mai 1667 à Vitry-le-François en Champagne. Fils de chirurgien, il n'est pas noble .Il a une bonne éducation dans une école catholique puis protestante ;il est en effet protestant.

A quinze ans il lit le traité du grand mathématicien néerlandais Huygens(1629-1695) sur les jeux de hasard.

la révocation de l'Edit de Nantes, en 1685 le conduit en prison puis à sa sortie à partir avec son frère pour Londres en 1688 .Il y restera 66 ans .Il donne des cours particuliers.

Il découvre les Principia de Newton .Il deviendra l'ami de Newton et de Halley astronome mais qui publiera en 1693 une table de mortalité ce qui intéressera aussi Moivre.

En 1695 il publie ses premier résultats sur la longueur ,et quadrature des courbes

En 1697, il est élu membre de la Royal Society

En 1707 il explique comment il résout z^n =a+ib d'où il sort qu'il connaissait la formule dite de Moivre.

$$(\cos(x) + i\sin(x))^n = \cos(nx) + i\sin(nx)$$

formule écrite ainsi par Euler en 1748 chapitre 8 § 133 de son livre Introductio in analysin infinitorum, volume 1 écrit en latin

$$(\cos z \pm \sqrt{-1}\sin z)^2 = \cos 2z \pm \sqrt{-1}\sin 2z,$$
$$(\cos z \pm \sqrt{-1}\sin z)^3 = \cos 3z \pm \sqrt{-1}\sin 3z,$$
$$(\cos z \pm \sqrt{-1}\sin z)^n = \cos nz \pm \sqrt{-1}\sin nz.$$

Quant à Moivre voiçi ce qu'il a écrit

Now the fifth root of the binomial $\frac{61}{64} + \sqrt{\frac{-375}{4096}}$ is $\frac{1}{4} + \frac{1}{4}\sqrt{-15}$, and of the binomial $\frac{61}{64} - \sqrt{\frac{-375}{4096}}$ is $\frac{1}{4} - \frac{1}{4}\sqrt{-15}$ whose semi-sum $\frac{1}{4} = y$. But if the extraction can not be performed, or should seem too difficult, the thing may always be effected by a table of natural sines in the following manner.

To the radius 1 let $a = \frac{61}{64} = 0.95112$ be the sine of a certain arc which therefore will be 72° 23′, the fifth part of which (because $n = 5$) is 14°28′; the sine of this is 0.24981, nearly $= \frac{1}{4}$. So also for equations of higher degree.[1]

[1] [From this example it is clear that in 1707 De Moivre was in possession of the formula

$$\tfrac{1}{2}\sqrt[n]{\sin n\phi + \sqrt{-1}.\cos n\phi} + \tfrac{1}{2}\sqrt[n]{\sin n\phi - \sqrt{-1}.\cos n\phi} = \sin\phi,$$

where n is an odd integer. In 1730, as we shall presently see, De Moivre formulated a relation equivalent to the following:

$$\tfrac{1}{2}\sqrt[n]{\cos n\phi + \sqrt{-1}.\sin n\phi} + \tfrac{1}{2}\sqrt[n]{\cos n\phi - \sqrt{-1}.\sin n\phi} = \cos\phi,$$

where n is any positive integer.]

A Source Book in Mathematics, Volume 3

Par David Eugene Smith

en 1730 de Moivre ecrit:

Problem III.—*To extract the nth root of the impossible binomial* $a + \sqrt{-b}$.

Let that root be $x + \sqrt{-y}$; then making $\sqrt[n]{a^2 + b} = m$, and $\frac{n-1}{2} = p$, n any integer, describe, or conceive to be described, a circle, the radius of which is $\sqrt{m}$, in which take an arc A the cosine of which is $\frac{a}{m^p}$, and let C be the whole circumference. To the same radius take the cosines of the arcs $\frac{A}{n}$, $\frac{C-A}{n}$, $\frac{C+A}{n}$, $\frac{2C-A}{n}$, $\frac{2C+A}{n}$, $\frac{3C-A}{n}$, $\frac{3C+A}{n}$, etc., till the number of them be

1718 il publie "the doctrine of chances"

THE
DOCTRINE
OF
CHANCES:
OR,
A Method of Calculating the Probability of Events in Play.

By *A. De Moivre.* F. R. S.

LONDON:
Printed by *W. Pearson*, for the Author. MDCCXVIII.

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dans son livre il étudie des jeux divers de des , de cartes (jeu du pharaon)

le livre est ordonné sous forme de problèmes comme celui de Huyghens

To find in how many throws of three Dice, one may undertake to throw three Aces.

The number of all the Chances upon three Dice being 216, out of which there is but one Chance for 3 Aces, and 215 againſt it, it follows that 215 ought to be multiply'd by 0.7, which being done, the product 150.5 will ſhew that the number of Chances requiſite to that effect will be 150, or very near it.

en 1718 il utilise la formule $p(A \cap B) = p(A \mid B)\, p(B)$ sur des exemples concrets

PROBLEM XIV.

Any number of things a, b, c, d, e, f, *being given, out of which two are taken as it happens: to find the Probability that any of them, as* a, *ſhall be the firſt taken, and any other, as* b, *the ſecond.*

SOLUTION.

The number of Things in this Example being ſix, it follows that the Probability of taking a in the firſt place is $\frac{1}{6}$: let a be conſider'd as taken, then the Probability of taking b will be $\frac{1}{5}$; wherefore the Probability of taking a, and then b, is $\frac{1}{6} \times \frac{1}{5} = \frac{1}{30}$.

Universally; let n be the number of Things; then the Probability of taking a in the first place, and b in the second will be $\frac{1}{n} \times \frac{1}{n-1}$, and the number of Permutations of those Things, taken two and two, will be $n \times n-1$.

In a Lottery consisting of 40000 *Tickets, among which are three particular Benefits, what is the Probability that taking* 8000 *of them, one or more of the particular Benefits shall be amongst them.*

SOLUTION.

First, In the Theorem belonging to the Remark of the foregoing Problem, having substituted respectively 8000, 40000, 32000, 3 and 1, in the room of c, n, d, a, and p; it will appear that the Probability of taking one precisely of the three particular Benefits, will be $\frac{8000 \cdot 320000 \cdot 31999 \cdot 3}{40000 \cdot 39999 \cdot 39998} = \frac{48}{125}$ nearly.

Secondly, c, n, d, a being interpreted as before, let us suppose $p = 2$: hence the Probability of taking precisely two of the particular Benefits will be found to be $\frac{8000 \cdot 7999 \cdot 31000 \cdot 3}{40000 \cdot 39999 \cdot 39998} = \frac{12}{125}$ nearly.

Thirdly, making $p = 3$, the Probability of taking all the three particular Benefits will be found to be $\frac{8000 \cdot 7999 \cdot 7998}{40000 \cdot 39999 \cdot 39998} = \frac{1}{125}$ very near.

Wherefore the Probability of taking one or more of the three particular Benefits will be $\frac{48+12+1}{125}$ or $\frac{61}{125}$ very near.

It is to be observed, that those three Operations might have been contracted into one, by inquiring the Probability of not taking any of the three particular Benefits, which will be found to be $\frac{32000 \cdot 31999 \cdot 31998}{40000 \cdot 39999 \cdot 39998} = \frac{64}{125}$ nearly, which being subtracted from Unity, the remainder $1 - \frac{64}{125}$ or $\frac{61}{125}$ will shew the Probability required, and therefore the Odds against taking any of three particular Benefits will be 64 to 61 nearly.

en 1725 Il étudie les statistiques de mortalité et la théorie des annuités (avec Halley).

en 1730 son grand ouvrage "Miscellanea Analytica" contient la formule de Stirling que James Stirling avait indiquée quelques mois plus tôt, et que de Moivre utilisa en 1733 pour décrire la loi normale comme une approximation de la binomiale dans le cas p=q=1/2

c'est lui qui a introduit pour la première fois la loi normale.

1735 il est associé à l'académie des sciences de Berlin

Célibataire, sans enfants , il passe son temps dans ses cours particuliers qu'il donne , dans l'étude, et dans la littérature. Il eût aimé être Molière avant que d'être Newton, disait -il .Il connaissait Rabelais presque par coeur;

Il fut un ami de 30 ans de Newton

en 1754, en juin il est élu membre étranger de l'Académie des sciences de Paris.

Il meurt le 27 novembre 1754 à Londres

une biographie en anglais