of *x* would be defined as a function such that, if *x— i —, ^ ·.* , then *τ }.√ι-yi*

*-y*=sin *x* ; the quantity π/2 would be defined to be the complete integral { ■ . We should then have π/2*= -x* Now change

Λ√ι-i∕≈ 2

the variable in the integral to *z,* where *y*2 + *z*2=l, we then have *- ~χ= f —^,z* , and *z* must be defined as the cosine of *x,* and is

2 J,√l-≈∙'

thus equal to sin (π/2-*x)* , satisfying the equation sin2*x*+cosaiε=l. Next consider the differential equation

*dy dr .*

--. ■- + . = 0.

V1 - *y2 ∖∕l-z2* This is equivalent to

<Z(yVl -z2 + zVl -y2) = 0 ; hence the integral is

y √ 1 - z2 + z √1 - *y2=*a constant. The constant will be equal to the value *u* of *y* when *z = 0;* whence y√l - *z*2 + *z√*l - *y*2 = *u*.

TRILOBITES. See Crustacea, vol. vi. p. 659 *sq.*

TRINCOMALEE, a town and naval station in the island of Ceylon, is situated on the north-east coast— which is bold, rocky, and picturesquely wooded—by road 113 miles north-north-east of Kandy, in 8° 33' 30" N. lat. and 81° 13' 10" E. long. It is built on the north side of the Bay of Trincomalee, on the neck of a bold peninsula separating the inner from the outer harbour. There is a lighthouse on the extremity of Foul Point at the southern side of the bay, and another on the summit of Round Island. The inner harbour is landlocked, with a safe anchorage and deep water close to the principal wharves ; the outer harbour has an area of about 4 square miles, with a depth of about 70 fathoms. There is an admiralty dockyard, and the town is the principal naval station in the Indian seas. The breadth of the streets and esplan­ades somewhat atones for the mean appearance of the houses, but the town generally has a gloomy and im­poverished aspect. Pearl oysters are found in the lagoon of Tambalagam to the west of the bay. The Government buildings include the barracks, the public offices and re­sidences of the civil and naval authorities, and the official house of the officer commanding-in-chief in the Indian seas. There is an hospital and outdoor dispensary, and also a friend-in-need society. The population of Trincomalee in 1881 was 10,180.

The town was one of the earliest settlements of the Malabar race in Ceylon, who at a very early period erected on a height at the extremity of the peninsula, now crowned by Fort Frederick, a temple dedicated to Konatha, or Konasir, named the “ temple of a thousand columns.” The building was desecrated and destroyed in 1622, when the town was taken by the Portuguese, who made use of the materials for the erection of the fort. The town was successively held by the Dutch (1639), the French (1673), the Dutch (1674), the French (1782), and the Dutch (1783). After a siege of three weeks it surrendered to the British fleet in 1795, and with other Dutch possessions in Ceylon was formally ceded to Great Britain by the treaty of Amiens in 1801. Its fortifications have lately been strengthened.

TRINIDAD, a West Indian island, lying north-east of Venezuela, between 10° 3' and 10° 50' N. lat. and 61° 39' and 62°

W. long., being the most southern of the chain of islands separating the Atlantic from the Caribbean Sea. Its area is 1754 square miles, or nearly 1,123,000 acres. In shape the island is almost rectangular, but from its north-west and south-west corners project two long horns towards Venezuela, enclosing the Gulf of Paria. The north-west horn terminates in several islands, in one of the channels between which (the Boca Grande) lies the small British island of Patos. The general aspect of Trini­dad is level. But three parallel ranges, varying from 600 to 3100 feet in height and clothed with forests, run from

The integral may also be obtained in the form

*yz* - √l - y2√l - z2=√l - u2.

Let .√'-7⅛=, 0=f-\* , γ=f-⅛=,

J0√1-s< p *Ja∙Vι-^ J<,√ι-<e we have a+β = y,* and sinγ = sinα cosβ + cosa sin/3, cos *y —* cos a cos *β* - sin *a* sin *β,*

the addition theorems. By means of the addition theorems and the values sin 1, cos =0 we can prove that sin (π/2 + **x**) = cos *x,* cos (π/2 = - sin *x* ; and thence by another use of the addition theorems that sin (π + *x*) = - sin*x*cos (π + *x*)= -cos*x,* from which the periodicity of the functions sin *x,* cos *x* follows.

We have also [ *-ι* loge (Vl - *y2 + ιf) ;*

J Vl-*y2*

whence loge ( Vl - *y2 + if)* + loge ( Vl - z2 + tz)=a constant.

Therefore ( Vl - *y2* + q∕)(Vl -z2 + tz) = Vl *-u2 + ιu,*

since *u=y* when z=0 ; whence we have the equation

(cos α +1 sin a)(cos *β* +1 sin *β) =* cos *(μ + β) + ι* sin (a + *β),* from which De Moivre’s theorem follows. (E. W. H. )

east to west. The plains are watered by numerous streams, and the mountains are deeply furrowed by innumerable ravines. The rivers falling into the gulf are somewhat ob­structed by shallows, especially the Caroni and the Couva. Geologically, as well as botanically and zoologically, Trini­dad differs little from the adjacent mainland, with which at one time it probably was connected. The soil, which is fertile, consists of clay, loam, and alluvial deposits. The Moriche palm and mountain cabbage, as well as the cedar and the balata, are prominent objects. Poisonous and medicinal plants grow everywhere, and the woods contain an inexhaustible supply of timber. There are two mineral springs. The most curious natural feature of the island is the pitch lake@@1 in La Brea, 90 acres in extent, which furnishes an important export. The climate is healthy, the mean temperature being in January 76° Fahr. and in September 79° ; it occasionally reaches 90°.

The population, which numbered 109,638 in 1871, was returned in 1881 at 153,128 (83,716 males and 69,412 females), and in 1885 at 171,914. Of these about 100,000 are natives of the island, prin­cipally of African race, 50,000 are coolies introduced from India (an industrious and prosperous element of the population), while the remainder includes the English and other European settlers. About 2000 coolies are introduced annually. Many French families from other parts of the West Indies settled in Trinidad many years ago, and traces of this and of the Spanish occupation are obvious in laws, municipal arrangements, language, and population. The two principal towns are Port of Spain and San Fernando. The former (34,000 inhabitants), the capital of the island, is built on a gently inclined plain near the north-east angle of the Gulf of Paria,

@@@1 This is vividly described by Charles Kingsley in *At Last.*