

# Math.Cos(Rational) Method

名前空間: WS.Theia.ExtremelyPrecise

アセンブリ: ExtremelyPrecise.dll

指定された角度のコサインを返します。

---

```
public static WS.Theia.ExtremelyPrecise.Rational  
Cos(WS.Theia.ExtremelyPrecise.Rational radian);
```

---

パラメーター

radian   Rational

ラジアンで表した角度。

戻り値

Rational

radian のコサイン。radian が NaN、NegativeInfinity、PositiveInfinity のいずれかに等しい場合、このメソッドは NaN を返します。

## 例

次の例では、三角関数を算出しています。

---

```
// Example for the trigonometric Math.Sin( Rational )  
// and Math.Cos( Rational ) methods.  
using System;  
using WS.Theia.ExtremelyPrecise;  
class SinCos  
{  
    public static void Main()  
    {  
        Console.WriteLine(
```

```

        "This example of trigonometric " +
        "Math.Sin( Rational ) and Math.Cos( Rational )" +
        "generates the following output." );
Console.WriteLine(
    "Convert selected values for X to radians " +
    "and evaluate these trigonometric identities:" );
Console.WriteLine( "      sin^2(X) + cos^2(X) == 1" +
    "      sin(2 * X) == 2 * sin(X) * cos(X)" );
Console.WriteLine( "      cos(2 * X) == cos^2(X) - sin^2(X)" );


UseSineCosine(15.0);
UseSineCosine(30.0);
UseSineCosine(45.0);


Console.WriteLine(
    "Convert selected values for X and Y to radians " +
    "and evaluate these trigonometric identities:" );
Console.WriteLine( "      sin(X + Y) == sin(X) * cos(Y) + cos(X) *
sin(Y)" );
Console.WriteLine( "      cos(X + Y) == cos(X) * cos(Y) - sin(X) *
sin(Y)" );
    UseTwoAngles(15.0, 30.0);
    UseTwoAngles(30.0, 45.0);
}

// Evaluate trigonometric identities with a given angle.
static void UseSineCosine(Rational degrees)
{
    Rational angle      = Math.PI * degrees / 180.0;
    Rational sinAngle = Math.Sin(angle);
    Rational cosAngle = Math.Cos(angle);


    // Evaluate sin^2(X) + cos^2(X) == 1.
    Console.WriteLine(
        "          Math.Sin({0} deg) ==
{1:E16}" +
        "          Math.Cos({0} deg) == {2:E16}"
    );
}

```

```

        degrees, Math.Sin(angle), Math.Cos(angle) );
Console.WriteLine(
    "(Math.Sin({0} deg))^2 + (Math.Cos({0} deg))^2 == {1:E16}",
    degrees, sinAngle * sinAngle + cosAngle * cosAngle );

// Evaluate sin(2 * X) == 2 * sin(X) * cos(X).
Console.WriteLine(
    "
        Math.Sin({0} deg) == {1:E16}",
    2.0 * degrees, Math.Sin(2.0 * angle) );
Console.WriteLine(
    "
    2 * Math.Sin({0} deg) * Math.Cos({0} deg) == {1:E16}",
    degrees, 2.0 * sinAngle * cosAngle );

// Evaluate cos(2 * X) == cos^2(X) - sin^2(X).
Console.WriteLine(
    "
        Math.Cos({0} deg) == {1:E16}",
    2.0 * degrees, Math.Cos(2.0 * angle) );
Console.WriteLine(
    "(Math.Cos({0} deg))^2 - (Math.Sin({0} deg))^2 == {1:E16}",
    degrees, cosAngle * cosAngle - sinAngle * sinAngle );
}

// Evaluate trigonometric identities that are functions of two angles.
static void UseTwoAngles(Rational degreesX, Rational degreesY)
{
    Rational angleX = Math.PI * degreesX / 180.0;
    Rational angleY = Math.PI * degreesY / 180.0;

    // Evaluate sin(X + Y) == sin(X) * cos(Y) + cos(X) * sin(Y).
    Console.WriteLine(
        "
        Math.Sin({0} deg) * Math.Cos({1} deg) +
        Math.Cos({0} deg) * Math.Sin({1} deg) == {2:E16}",
        degreesX, degreesY, Math.Sin(angleX) * Math.Cos(angleY) +
        Math.Cos(angleX) * Math.Sin(angleY));
    Console.WriteLine(
        "
        Math.Sin({0} deg) == {1:E16}",

```

```

degreesX + degreesY, Math.Sin(angleX + angleY));

// Evaluate cos(X + Y) == cos(X) * cos(Y) - sin(X) * sin(Y).
Console.WriteLine(
    "          Math.Cos({0} deg) * Math.Cos({1} deg) -\n" +
    "          Math.Sin({0} deg) * Math.Sin({1} deg) == {2:E16}",
    degreesX, degreesY, Math.Cos(angleX) * Math.Cos(angleY) -
    Math.Sin(angleX) * Math.Sin(angleY));
Console.WriteLine(
    "                                Math.Cos({0} deg) == {1:E16}",
    degreesX + degreesY, Math.Cos(angleX + angleY));
}
}
/*

```

This example of trigonometric `Math.Sin( Rational )` and `Math.Cos( Rational )` generates the following output.

Convert selected values for X to radians  
and evaluate these trigonometric identities:

```

sin^2(X) + cos^2(X) == 1
sin(2 * X) == 2 * sin(X) * cos(X)
cos(2 * X) == cos^2(X) - sin^2(X)

                                Math.Sin(15 deg) == 2.5881904510252074E-
001

                                Math.Cos(15 deg) == 9.6592582628906831E-
001
(Math.Sin(15 deg))^2 + (Math.Cos(15 deg))^2 ==
1.0000000000000000E+000

                                Math.Sin(30 deg) == 4.9999999999999994E-
001
2 * Math.Sin(15 deg) * Math.Cos(15 deg) == 4.9999999999999994E-001
                                Math.Cos(30 deg) == 8.6602540378443871E-
001
(Math.Cos(15 deg))^2 - (Math.Sin(15 deg))^2 == 8.6602540378443871E-001

                                Math.Sin(30 deg) == 4.9999999999999994E-

```

001

$$\text{Math.Cos}(30 \text{ deg}) == 8.6602540378443871\text{E-}$$

001

$$(\text{Math.Sin}(30 \text{ deg}))^2 + (\text{Math.Cos}(30 \text{ deg}))^2 == \\ 1.0000000000000000\text{E}+000$$

$$\text{Math.Sin}(60 \text{ deg}) == 8.6602540378443860\text{E-}$$

001

$$2 * \text{Math.Sin}(30 \text{ deg}) * \text{Math.Cos}(30 \text{ deg}) == 8.6602540378443860\text{E-001}$$

$$\text{Math.Cos}(60 \text{ deg}) == 5.0000000000000001\text{E-}$$

001

$$(\text{Math.Cos}(30 \text{ deg}))^2 - (\text{Math.Sin}(30 \text{ deg}))^2 == 5.0000000000000002\text{E-001}$$

$$\text{Math.Sin}(45 \text{ deg}) == 7.0710678118654746\text{E-}$$

001

$$\text{Math.Cos}(45 \text{ deg}) == 7.0710678118654757\text{E-}$$

001

$$(\text{Math.Sin}(45 \text{ deg}))^2 + (\text{Math.Cos}(45 \text{ deg}))^2 == \\ 1.0000000000000000\text{E}+000$$

$$\text{Math.Sin}(90 \text{ deg}) ==$$

$$1.0000000000000000\text{E}+000$$

$$2 * \text{Math.Sin}(45 \text{ deg}) * \text{Math.Cos}(45 \text{ deg}) == 1.0000000000000000\text{E}+000$$

$$\text{Math.Cos}(90 \text{ deg}) == 6.1230317691118863\text{E-}$$

017

$$(\text{Math.Cos}(45 \text{ deg}))^2 - (\text{Math.Sin}(45 \text{ deg}))^2 == 2.2204460492503131\text{E-016}$$

Convert selected values for X and Y to radians

and evaluate these trigonometric identities:

$$\sin(X + Y) == \sin(X) * \cos(Y) + \cos(X) * \sin(Y)$$

$$\cos(X + Y) == \cos(X) * \cos(Y) - \sin(X) * \sin(Y)$$

$$\text{Math.Sin}(15 \text{ deg}) * \text{Math.Cos}(30 \text{ deg}) +$$

$$\text{Math.Cos}(15 \text{ deg}) * \text{Math.Sin}(30 \text{ deg}) == 7.0710678118654746\text{E-001}$$

$$\text{Math.Sin}(45 \text{ deg}) == 7.0710678118654746\text{E-}$$

001

$$\text{Math.Cos}(15 \text{ deg}) * \text{Math.Cos}(30 \text{ deg}) -$$

$$\text{Math.Sin}(15 \text{ deg}) * \text{Math.Sin}(30 \text{ deg}) == 7.0710678118654757\text{E-001}$$

```
Math.Cos(45 deg) == 7.0710678118654757E-001

Math.Sin(30 deg) * Math.Cos(45 deg) +
Math.Cos(30 deg) * Math.Sin(45 deg) == 9.6592582628906831E-001
Math.Sin(75 deg) == 9.6592582628906820E-001

Math.Cos(30 deg) * Math.Cos(45 deg) -
Math.Sin(30 deg) * Math.Sin(45 deg) == 2.5881904510252085E-001
Math.Cos(75 deg) == 2.5881904510252096E-001

*/
```

---

## 注釈

引数に入力する角度はラジアン単位である必要があります。角度に `Math.PI/180` を乗算する事でラジアン単位に変換できます。

## 適用対象

.NET Core  
2.0  
.NET Framework  
4.6.1  
.NET Standard  
2.0  
UWP  
10.0.16299  
Xamarin.Android  
8.0  
Xamarin.iOS  
10.14  
Xamarin.Mac  
3.8