Mth 113 | Monday 2-4-13 | Class Notes

① $\dfrac{\sin\theta}{\tan\theta} = \dfrac{\sin\theta}{\dfrac{\sin\theta}{\cos\theta}} = \boxed{\cos\theta}$

③ $\tan\theta \csc\theta = \dfrac{\sin\theta}{\cos\theta} \cdot \dfrac{1}{\sin\theta}$

$= \boxed{\sec\theta}$

⑤ $\cot^2\theta \sin^2\theta$

$\dfrac{\cos^2\theta}{\sin^2\theta} \cdot \sin^2\theta = \boxed{\cos^2\theta}$

⑦ $(\tan^2\theta + 1)(1 - \sin^2\theta)$

$\Downarrow$

$\sec^2\theta \cdot \cos^2\theta$

$\dfrac{1}{\cos^2\theta} \cdot \cos^2\theta$

$\boxed{1}$

$\dfrac{\sin^2\theta + \cos^2\theta = 1}{\cos^2\theta \quad \cos^2\theta \quad \cos^2\theta}$

$\boxed{\tan^2\theta + 1 = \sec^2\theta}$

⑨ $\dfrac{(\sec\theta - 1)(\sec\theta + 1)}{\sin^2\theta} = \dfrac{\sec^2\theta - 1}{\sin^2\theta}$

Since $\sec^2\theta - 1 = \tan^2\theta$

$$\dfrac{\tan^2\theta}{\sin^2\theta} = \dfrac{\dfrac{\sin^2\theta}{\cos^2\theta}}{\sin^2\theta} = \dfrac{1}{\cos^2\theta}$$

$$= \boxed{\sec^2\theta}$$

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⑪ $\dfrac{\csc\theta\sin\theta}{\cot\theta} = \dfrac{\dfrac{1}{\sin\theta}\cdot\sin\theta}{\cot\theta} = \boxed{\tan\theta}$

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⑬ $\cos\theta(\sec\theta - \cos\theta)$

$\cos\theta\left(\dfrac{1}{\cos\theta} - \cos\theta\right)$

$1 - \cos^2\theta = \boxed{\sin^2\theta}$

(15) $\csc^2\theta(1 - \cos^2\theta)$

$$\frac{1}{\sin^2\theta}(\sin^2\theta) = \boxed{1}$$

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(17) $\cot^2\theta - \csc^2\theta$

$$\frac{\cos^2\theta}{\sin^2\theta} - \frac{1}{\sin^2\theta} = \frac{\cos^2\theta - 1}{\sin^2\theta}$$

$$= \frac{-\sin^2\theta}{\sin^2\theta}$$

$$= \boxed{-1}$$

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(19) $\tan^2\theta(\cot^2\theta + 1)$

$$1 + \tan^2\theta = \boxed{\sec^2\theta}$$

(EX) $1 - \cos^2\theta$

$(1 - \cos\theta)(1 + \cos\theta)$

(25) $\sin x + \cos x \cot x$

$$\frac{\sin x}{1} + \frac{\cos x \cos x}{\sin x}$$

$$\frac{\sin^2 x}{\sin x} + \frac{\cos^2 x}{\sin x}$$

$$\frac{\sin^2 x + \cos^2 x}{\sin x} = \frac{1}{\sin x}$$

$$= \boxed{\csc x}$$

The Math Forum @ Drexel   [DONATE]

THE MATH FORUM   ASK DR. MATH
QUESTIONS & ANSWERS FROM OUR ARCHIVES

Division by Zero

Date: 8/27/96 at 19:0:36
From: Anonymous
Subject: Division by Zero

What is the value of a number divided by zero?

Date: 8/27/96 at 22:1:18
From: Doctor Robert
Subject: Re: Division by Zero

Division by zero is an operation for which you cannot find an answer,
so it is disallowed. You can understand why if you think about how
division and multiplication are related.

     12 divided by 6 is 2
because
      6 times 2 is 12

     12 divided by 0 is x
would mean that
     0 times x = 12.

But no value would work for x because 0 times any number is 0!
So division by zero doesn't work.

-Doctor Robert, The Math Forum
 Check out our web site! http://mathforum.org/dr.math/

My teacher says you can't divide a number by zero. Why?

Let's look at some examples of dividing other numbers.

10/2 = 5   This means that if you had ten blocks, you could separate them into five groups of two.

9/3 = 3   This means that if you had nine blocks, you could separate them into three groups of three.

5/1 = 5   Five blocks could be separated into five groups of one.

5/0 = ?   Into how many groups of zero could you separate five blocks?

It doesn't matter how many groups of zero you have, because they would never add up to five since $0+0+0+0+0+0 = 0$. You could even have one million groups of zero blocks, and they would still add up to zero. So, it doesn't make sense to divide by zero since there is not a good answer.