

Identities and Domain of Validity

Consider the following equation: $\frac{x^2 - 4}{x - 2} = \frac{(x + 2)(x - 2)}{x - 2} = x + 2$.

The equation $\frac{x^2 - 4}{x - 2} = x + 2$ is called an **identity**. An identity is an equation that is true for all numbers that are in the domain of both sides of the equation, in this case all real numbers except $x = 2$.

This is called the **domain of validity** for the equation.

Basic Trigonometric Identities.

You know from the unit circle that $\sin \theta = y$ and

$\cos \theta = x$. And since

$\tan \theta = \frac{y}{x}$ we have the

identity $\tan \theta = \frac{\sin \theta}{\cos \theta}$.

Since $\cos \theta = 0$ for all

$\theta = \frac{\pi}{2} \pm n \cdot \pi$, the domain of

validity is all real numbers

except $\theta = \frac{\pi}{2} \pm n \cdot \pi$

You can see from the graph of $y = \tan x$, that tangent is undefined at those values for x .

