August 25, 2026

National Banana Split Day

Today in History:

The Great Moon Hoax (1835)

The *Wizard of Oz* debuts (1939)

Number of the Day: 48

48 = 2 x 2 x 2 x 2 x 3

48 is the smallest number to have ten different factors:

1, 2, 3, 4, 6, 8, 12, 16, 24, and 48.

Fun Fact:

Franklin Mars invented the Snickers Bar in 1930.

Quote of the Day:

"I love Mickey Mouse more than any woman I have ever known."

-Walt Disney

Today's Weather:

Sun and clouds mixed, high near 73°.

Math 121

Quiz #1

Find the equation of the line parallel to

$$y = 3x - 4$$

that passes through $(1, 1)$.

$m = 3$

$y = 3x + b$

$1 = 3(1) + b$

$b = -2$

$\boxed{y = 3x - 2}$

$(3, 5)$ $(-\infty, \infty)$

mod 2 $\quad$ * 9

$y = -x^2 + 4x$

$y = -(x^2 - 4x + 4) + 4$

$= -(x-2)^2 + 4$

$y = 4 - \underbrace{(x-2)^2}_{\geq 0}$

MAX = 4

$x = 2$

FUNCTIONS

POLYNOMIAL

$$f(x) = a_N x^N + a_{N-1} x^{N-1} + \cdots + a_1 x + a_0$$

DEGREE N DOMAIN $\forall x$

a_N LEADING CO.

RATIONAL FUNCTIONS

$$f(x) = \frac{P(x)}{Q(x)}$$

$P(x), Q(x)$ ARE POLY.

DOMAIN $\forall x$ EXCEPT $Q(x) = 0$

EXAMPLE

$$f(x) = \frac{x}{x+1} \qquad x \neq -1$$

$$f(x) = \frac{x^2 - 4}{x - 2} \qquad x \neq 2$$

$$f(x) = \frac{1}{x^2}$$

ALGEBRAIC

RATIONAL + ROOTS

$$f(x) = \sqrt[3]{\frac{x^2 + 5}{\sqrt{x}}}$$

EXPONENTIAL

$f(x) = a^x \qquad a > 0$

DOMAIN $\forall x$

LOGS

$f(x) = \log_a x$

$\log x$

$a = 10$

$\ln x$

$a = e \approx 2.718281828459\ldots$

TRIG

$\sin x \qquad \cos x \qquad \tan x$

$\csc x \qquad \sec x \qquad \cot x$

NEW FUNCTIONS FROM OLD

$f(x) \pm g(x) = (f \pm g)(x)$

$f(x) \cdot g(x) = (f \cdot g)(x)$

$\frac{f(x)}{g(x)} = \left(\frac{f}{g}\right)(x)$

COMPOSITION

$(f \circ g)(x) = f(g(x))$

$(g \circ f)(x) = g(f(x))$

EXAMPLE

$f(x) = \frac{x}{x+1}$ $\quad g(x) = \sin x$

$(f \circ g)(x) = f(g(x)) = f(\sin x) = \frac{\sin x}{\sin x + 1}$

$(g \circ f)(x) = g(f(x)) = g\left(\frac{x}{x+1}\right) = \sin\left(\frac{x}{x+1}\right)$

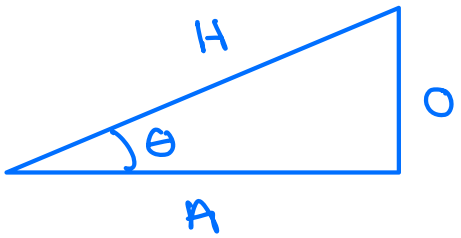
$\boxed{2} + 3 = 5$

$x + 3 = 5$

$f(x) = \frac{x}{x+1}$ $\quad f(\boxed{}) = \frac{\boxed{}}{\boxed{} + 1}$

$f(g(x)) = \frac{g(x)}{g(x)+1}$

TRIG

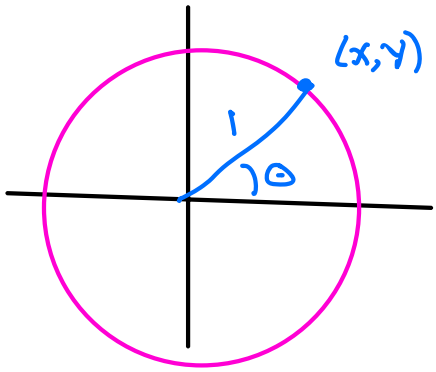


$\sin\theta = \frac{O}{H}$

$\cos\theta = \frac{A}{H}$

$\tan\theta = \frac{O}{A}$

$\sec\theta = \frac{1}{\cos\theta}$ $\quad \csc\theta = \frac{1}{\sin\theta}$ $\quad \tan\theta = \frac{1}{\cot\theta}$

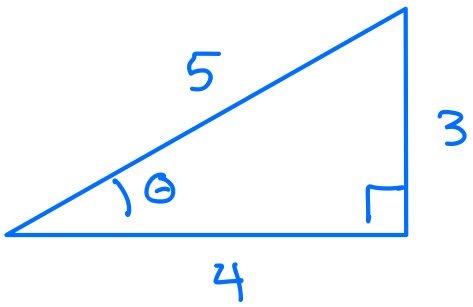


$x^2 + y^2 = 1$

$x = \cos\theta$

$y = \sin\theta$

$\sin\theta = \frac{3}{5}$ $\quad 0 < \theta < \frac{\pi}{2}$



$\cos\theta = \frac{4}{5}$

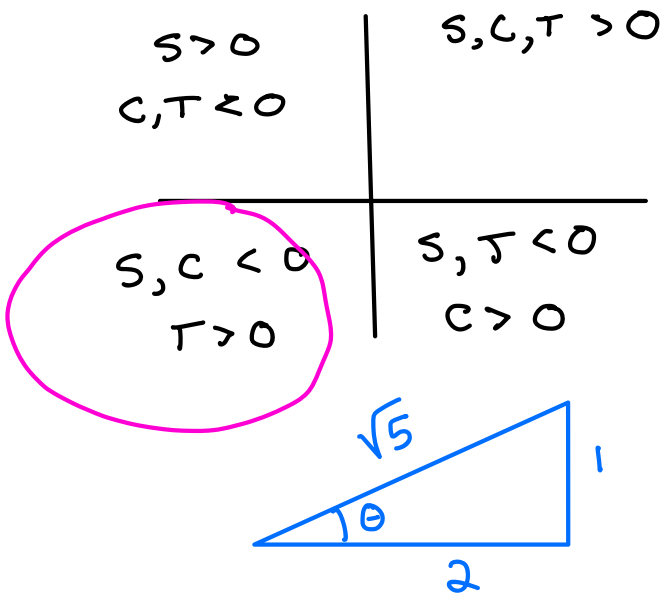
$\tan\theta = \frac{3}{4}$

$\cot\theta = \frac{4}{3}$

$\sec\theta = \frac{5}{4}$

$\csc\theta = \frac{5}{3}$

$\tan\theta = \frac{1}{2}$ $\quad \cos\theta < 0$



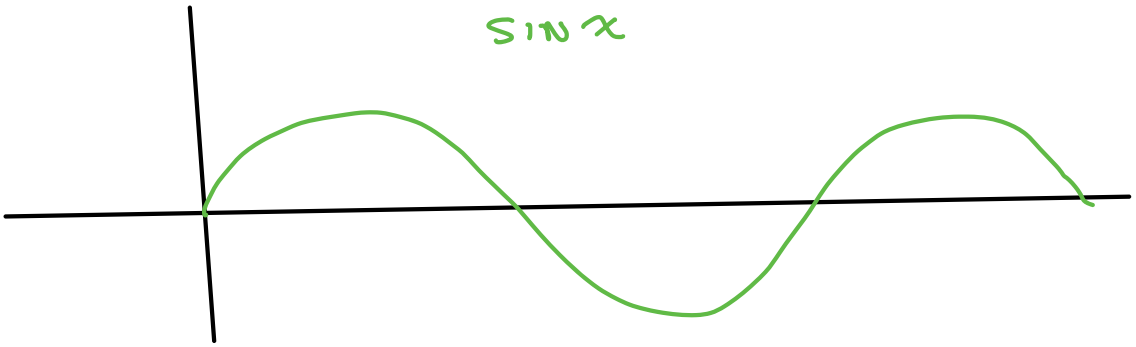
$\sin\theta = -\frac{1}{\sqrt{5}}$

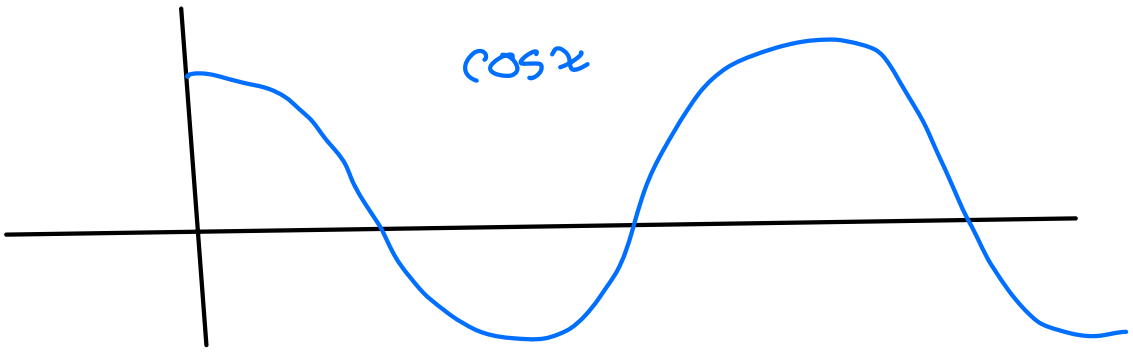
$\cos\theta = -\frac{2}{\sqrt{5}}$

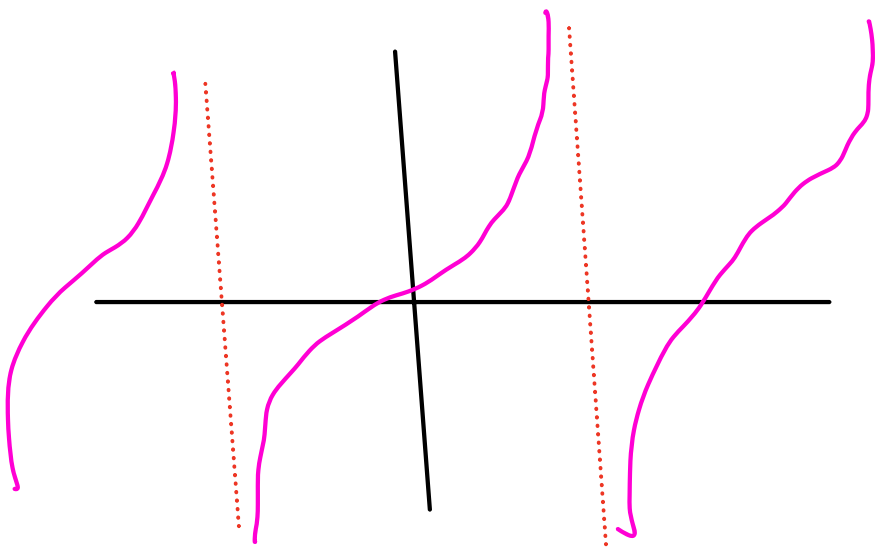
$\cot\theta = \frac{2}{1}$

$\sec\theta = -\frac{\sqrt{5}}{2}$

$\csc\theta = -\frac{\sqrt{5}}{1}$







TAN X