

<https://www.desmos.com/calculator>

$\sin\left(\frac{28\pi}{3}\right)$

$9\frac{1}{3}$ mixed fractions
suck.
 $\frac{28}{3}$ or $9 + \frac{1}{3}$

①
Written #2
Assignment 1

$\frac{28}{3} = 9 + \frac{1}{3}$ means

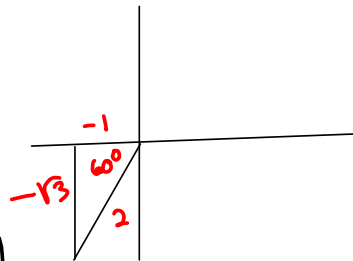
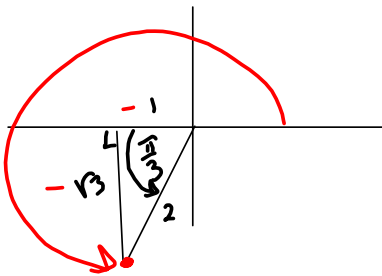
$28 = 9(3) + \frac{1}{3}(9) = 27 + 1$

$\frac{28\pi}{3} = 9\pi + \frac{1}{3}\pi = 8\pi + \left(\pi + \frac{1}{3}\pi\right)$

so $\sin\left(\frac{28\pi}{3}\right) = \sin\left(8\pi + \frac{4\pi}{3}\right)$

A multiple of 2π

so $\sin\left(\frac{28\pi}{3}\right) = \sin\left(\frac{4\pi}{3}\right)$

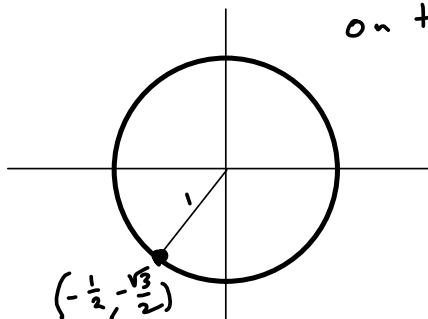


$\frac{4\pi}{3} \cdot \frac{180^\circ}{\pi} = 4 \cdot 60^\circ$
 $= 240^\circ$
 $= 180^\circ + 60^\circ$

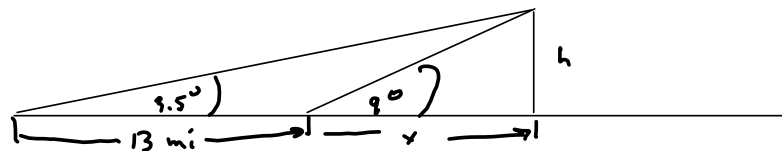
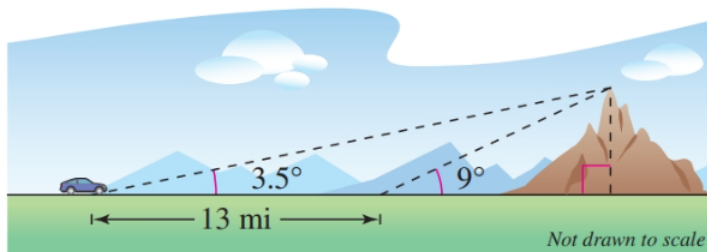
Reference angle
is 60° or $\frac{\pi}{3}$.

$\sin\left(\frac{28\pi}{3}\right) = -\frac{\sqrt{3}}{2}$
 $\cos\left(\frac{28\pi}{3}\right) = -\frac{1}{2}$

on the unit circle, this
looks like:



68. **Height of a Mountain** In traveling across flat land, you see a mountain directly in front of you. Its angle of elevation (to the peak) is 3.5° . After you drive 13 miles closer to the mountain, the angle of elevation is 9° (see figure). Approximate the height of the mountain.



want $h =$ height of mountain, in ft (eventually)
 $x =$ distance from 2nd sighting to mountain. (in miles)

$$\frac{h}{x+3} = \tan(3.5^\circ)$$

$$h = (x+3)\tan(3.5^\circ)$$

$$\frac{h}{x} = \tan(9^\circ)$$

$$h = x \tan(9^\circ)$$

$$\begin{aligned}
 h &= h \\
 x \tan(3.5^\circ) + 3 \tan(3.5^\circ) &= x \tan(9^\circ) \\
 2x + 3a &= bx \quad (a = \tan(3.5^\circ), b = \tan(9^\circ)) \\
 2x - bx &= -3a \\
 (2-b)x &= -3a \\
 x &= \frac{-3a}{2-b} = \frac{-3 \tan(3.5^\circ)}{\tan(3.5^\circ) - \tan(9^\circ)} \approx 0.6291038374 \\
 &\approx x
 \end{aligned}$$

Desmos is in radians mode, by default.

On *your* calculator, make sure you're in the right mode.

I'm gonna have to tweak the inputs on Desmos.

$$\begin{aligned}
 h &= x \tan(9^\circ) \\
 &= (0.629103837 \dots) \tan(9^\circ) \\
 &\approx 0.0996402591926 \text{ mi} \rightarrow
 \end{aligned}$$

$$h \approx (0.0996402591926 \text{ mi}) \left(\frac{5280 \text{ ft}}{1 \text{ mi}} \right) \approx 526.100568537 \text{ ft} \\
 \approx \boxed{h \approx 526 \text{ ft}}$$

Screen capture of Desmos for the previous question.

$$\frac{\tan\left(3.5 \cdot \frac{\pi}{180}\right)}{\tan\left(3.5 \cdot \frac{\pi}{180}\right) - \tan\left(9 \cdot \frac{\pi}{180}\right)} \quad \times$$

= 0.6291038374

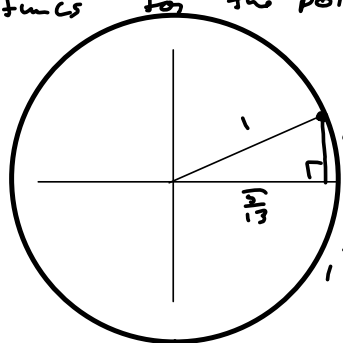
$$0.6291038374 \cdot \tan\left(9 \cdot \frac{\pi}{180}\right) \quad \times$$

= 0.0996402591926

$$0.0996402591926 \cdot \frac{5280}{1} \quad \times$$

= 526.100568537

Find 6 trig funcs for the point

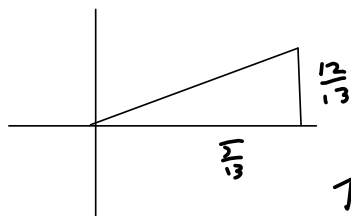


Build A Question

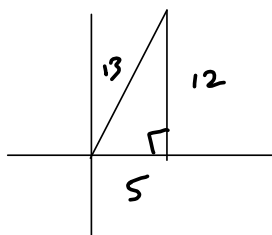
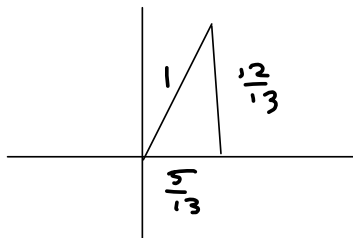
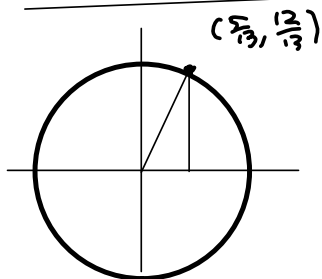
$$\frac{5}{13}$$

$$1^2 - \left(\frac{5}{13}\right)^2 = \frac{169 - 25}{169}$$

$$= \frac{144}{169} = y^2 \rightarrow y = \frac{12}{13}$$



This is all wrong

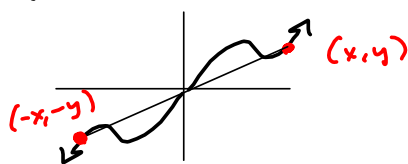


$$\begin{aligned} \sin \theta &= \frac{12}{13} & \csc \theta &= \frac{13}{12} \\ \cos \theta &= \frac{5}{13} & \sec \theta &= \frac{13}{5} \\ \tan \theta &= \frac{12}{5} & \cot \theta &= \frac{5}{12} \end{aligned}$$

Even/Odd:

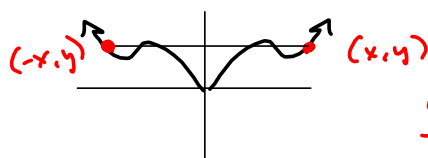
sine ODD
 cosine EVEN
 tangent ODD

$$f(-x) = -f(x) \text{ ODD}$$



sine, tangent
 Symmetric
 thru the
 origin

$$\text{Even: } f(-x) = f(x)$$



Symmetric
 about y-axis

cosine

Even - +
 Odd - -

$$\frac{\sin(x) \tan(x) \cos(x)}{\sec(x) \cot(x)} = \frac{(-)(-)(+)}{(+)(-)} = \frac{+}{-} = - \text{ ODD}$$

$$\frac{x^2 + x^4}{x^3} = \frac{+}{-} = - \text{ ODD}$$

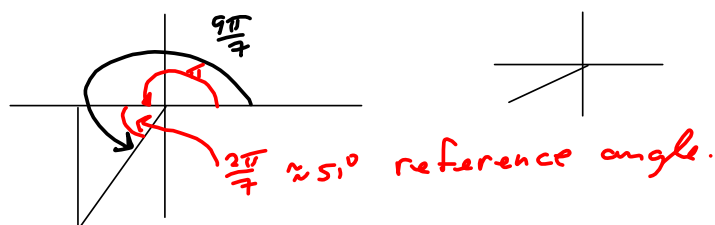
$$\frac{x^2 + x^3}{x^4} = \frac{\text{Neither}}{+}$$

I'll be grading the Week 1's in detail today and tomorrow.

Been very very busy getting everything lined out and handling student questions from 6 am to 10 pm. Things are settling down. People are figuring out how to get work done and use the tools.

Angelica, Alexis, Grady, and Dante stuck it out and tried to get some work done during the hour.

$$\frac{9\pi}{7} = \frac{7\pi}{7} + \frac{2\pi}{7} = \pi + \frac{2\pi}{7} \approx \pi + \frac{6.28}{7}$$



$$\frac{9\pi}{7} \cdot \frac{180}{\pi} - 180$$

$$= 51.4285714286$$

convert to degrees.

Evidently in $Q III$, so subtract 180° to get the reference angle of about 51°

$$\frac{9\pi}{7} = \pi + \frac{2\pi}{7}$$

$$= 180^\circ + 51.4285714286^\circ$$

Bigger than 45° , so

