

3.3: The unit circle and Circular Functions

Circular Functions:

we write our trig functions as functions of real numbers rather than functions of angles.

Any real number α can be thought of as the radian measure of some angle.

If we use the unit circle ($r=1$), the real number α is the number of times that the radius of 1 will fit onto the intercepted arc.

We call this a directed arc

(positive = counterclockwise,
negative = clockwise as usual)

Trig functions = circular functions

$$\sin \alpha = y$$

$$\cos \alpha = x$$

$$\tan \alpha = \frac{y}{x}$$

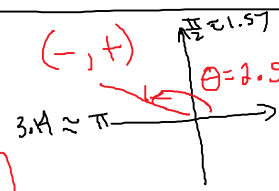
$$\csc \alpha = \frac{1}{y}$$

$$\sec \alpha = \frac{1}{x}$$

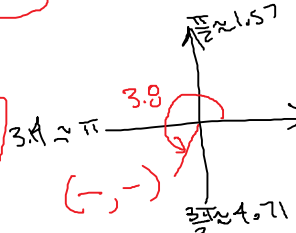
$$\cot \alpha = \frac{x}{y}$$

Decide whether each value is positive or negative (without a calculator)

1) $\cos(2.9)$ is negative



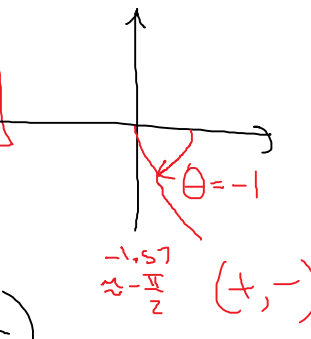
2) $\sin(3.8)$ is negative



3) $\tan(4)$
 4 is in QIII
 so $\tan(4) = \frac{\sin(4)}{\cos(4)} \Rightarrow \frac{(-)}{(-)} = \boxed{\text{positive}}$

4) $\cos(-2)$

5) $\sin(-1)$ is negative



6) $\sin(6.2)$

Ex: Find $\sin(3.8)$, $\cos(3.8)$, $\sec(3.8)$, $\csc(3.8)$
 Put calculator in radian mode

$\sin(3.8) \approx \boxed{-0.61186}$

$\csc(3.8) \approx \boxed{-1.63437}$