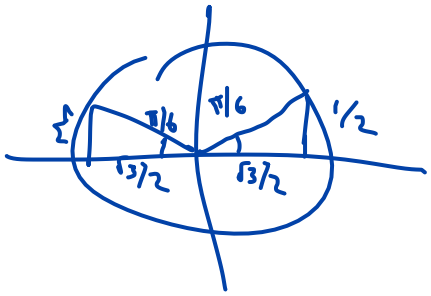
Math 135, Calculus 1, Fall 2020

Weekly Quiz 09-16

Question 1. (1) Find all values of θ between 0 and 2π such that $\csc(\theta) = 2$.

$\csc\theta = \frac{1}{\sin\theta}$, so $\sin\theta = \frac{1}{2}$

$\theta = \pi/6$ & $5\pi/6$



(2) Compute $\sin^{-1}(1/2)$.

range $\sin^{-1}$ = restricted domain of $\sin = [-\pi/2, \pi/2]$

$\theta = \pi/6$

Question 2. The population of bacteria on some petri dish as a function of time (in minutes) is given by

$$Q(t) = 400 \cdot 3^{t/45}.$$

(1) How long does it take the population to triple? Given an exact value (no decimal approximation; can use algebraic or transcendental functions).

$1200 = 400 \cdot 3^{t/45}$

$3 = 3^{t/45}$

$t/45 = 1$

$t = 45$

(2) How long does it take for the population to double? Given an exact value.

$800 = 400 \cdot 3^{t/45}$

$2 = 3^{t/45}$

$\log_3(2) = t/45$

$t = 45\log_3(2)$