

Chapter 1.5: A Little more with Trig Functions

Calculus I

College of the Atlantic. October 3, 2024

1. Make a rough sketch of the following functions:

(a) $\sin(x)$

(b) $3\sin(x)$

(c) $3\sin(x) + 3$

(d) $3\sin(3x) + 3$

(e) $3\sin(3(x - 3)) + 3$

2. Solve for x : $\cos(x) = .9$.

3. Solve for x : $\cos(x) = x$.

4. Solve for x : $\cos(x) = 2$.

5. The yearly population $P(t)$ of unicorns on an island is well approximated by:

$$P(t) = 1000 + 120 \sin\left(\frac{\pi}{6}(t - 2)\right), \quad (1)$$

where t is measured in years since 1980.

(a) What is the period of the unicorn oscillations?

(b) What is the maximum number of unicorns found on the island?

(c) What is the minimum number of unicorns found on this island?

(d) What year after 1980 does the first maximum unicorn population occur?

6. Write a formula for a sine function that has an amplitude of 3, a period of 4 and a value of 2 at $t = 0$.