Calculus I - MAC 2311 - Section 001
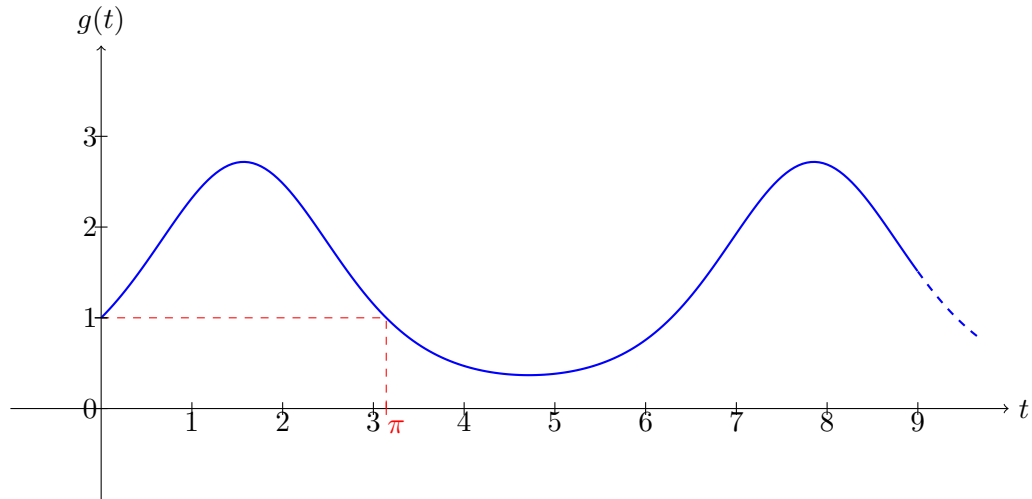## Review session Test 2
2/28/2017

Ex 1. The equation of motion of a **goldfish** which swims horizontally in a bowl is:
$$g(t) = e^{\sin(t)},$$
where t is in seconds and $g(t)$ is in inches.

a) Find the linearization at $t = \pi$ and use it to approximate the position of the goldfish at $t = 3$ sec.
b) Find the velocity of the goldfish as a function of t.
c) When is the velocity zero?
d) Find the acceleration as a function of t.
e) Find the acceleration at $t = \pi$.

Ex 2. Sketch the graph of a function $f(x)$ which satisfies **all** the following conditions:

a) $f'(x) < 0$ for all $x < -1$,

b) $f'(-1)$ does not exist,

c) $f(-1) = 1$,

d) $f'(x) = 0$ for all x in $(-1, 1]$,

e) $f'(x) < 0$ for all x in $(1, \infty)$.

Ex 3. Compute the derivative of the following functions. Before starting computing your derivative, think if it is possible to simplify the function.

a) $f(x) = x^{x^2+2x}$

b) $f(u) = e^{u^2} \cdot \ln u$

c) $g(x) = \left(\ln(\pi\sqrt{x})\right)^e$

d) $h(s) = \dfrac{1}{e^{\sin(2ks)}}$, where k is a constant.

e) $w(\theta) = e^{\ln(\ln(\theta^2))}$

f) $f(x) = x^{\cos(\pi x)}$