

Homework #26

First & Last Name: _____

Class: _____

For homework to be graded, it must be *fully completed*. This means you must **show your work**.

- Inscribed rectangles are below a curve. Circumscribed rectangles are above a curve. For the function $y = \sqrt{4 - x^2}$ complete the following problems. [Desmos](https://www.desmos.com/calculator/2ynohzn7bk) (desmos.com/calculator/2ynohzn7bk).
 - Calculate the area under the curve from $-2 \leq x \leq 2$ using four inscribed rectangles
 - Calculate the area under the curve from $-2 \leq x \leq 2$ using four circumscribed rectangles.
 - Estimate the actual area under the curve using your answers to parts (a) and (b).
- Suppose f and g are both discontinuous at $x = 3$. Using the table below, for which of the functions does the limit as x approaches 3 appear to exist? Justify your answer.

x	2.8	2.9	2.99	3	3.01	3.1	3.2
$f(x)$	6.97	6.98	6.99	?	7.01	7.02	7.03
$g(x)$	6.97	6.98	6.99	?	7.99	7.98	7.97

- Let f be an even function such that $f(2) = 4$ and $f(10) = 20$. Which of the following statements must be true? Could be true? Must be false?
 - $f(-10) = 20$
 - $f(-2) = -4$
 - $f(0) = 0$
- [Challenge]** If $1 < a < b$, which of the following logarithmic expressions represents a value that is negative? Between 0 and 1? Equal to 1? Greater than 1?
 - $\log_a(b)$
 - $\log_b \frac{1}{a}$
 - $\log_b(a)$
 - $\log_a(a)$
- [Challenge]** What are the x - and y -intercepts of the graph of $x + 3 = 3^{3^{(y+1)}}$?
- Let $f(x) = x^2 - 9$ and $g(x) = 2x^2 - 12x + 18$. State all horizontal asymptotes, vertical asymptotes, and holes (if any) for

$$y = \frac{f(x)}{g(x)} \quad \text{and} \quad y = \frac{g(x)}{f(x)}$$
- The region bounded by $y = -x + 6$ and the coordinate axes is rotated about the y -axis. Calculate the volume of the resulting solid.