

## Homework #13

Due Friday April 15th in Gradescope by 11:59 pm ET

**Goal:** Solidify Area Between Curves, and early Exponentials

For each of the following 1-6,

- Compute the area of the described bounded region, enclosed by the given curves.
- Sketch the curves and shade the bounded region.

1.  $y = x + 1$  and  $y = 9 - x^2$ , between  $x = -1$  and  $x = 2$

2.  $y = \sin x$  and  $y = x$ , between  $x = \frac{\pi}{2}$  and  $x = \pi$

3.  $y = (x - 2)^2$  and  $y = x$

4.  $y = \cos x$  and  $y = 2 - \cos x$ , between  $x = 0$  and  $x = 2\pi$

5.  $y = x^3$  and  $y = x$

6.  $y = |x|$  and  $y = x^2 - 2$

7. Sketch  $f(x) = e^x$ .

Differentiate each of the following functions.

8.  $y = e^x$

9.  $y = e^5$

10.  $y = e^{2x}$

11.  $y = (x^3 + 2x) \cdot e^x$

12.  $f(x) = \frac{e^x}{1 - e^x}$

13.  $f(x) = e^{-2x} \cdot \cos x$

14.  $y = \frac{1}{e^x}$

15.  $y = e^{3x} + \frac{1}{e^{3x}}$

16.  $y = e^{\sqrt{x}}$

17.  $f(x) = e^{\sin x}$

18.  $f(x) = \sin(e^x)$

# REGULAR OFFICE HOURS

**Monday: 1:00–3:00 pm**

**Tuesday: 12:00–4:00 pm**

7:30–9:00 pm TA Bobby, SMUDD 205

**Wednesday: 1:00–3:00 pm**

**Thursday: none for Professor**

7:30–9:00 pm TA Bobby, SMUDD 205

**Friday: 12:00–2:00 pm**

- Last month, make a new final push.