Math 106, Spring 2022

Homework #2

Due **Friday, February 11th** in Gradescope by 11:59 pm ET

Watch *Trigonometry Review* Videos, Parts 1 and 2

Goal: Review More Derivatives, Trigonometry, Angles & Trigonometric Derivatives.

For each HW, **match** your final answers to the posted Answer Key.

For $\#1-5$, compute the Derivative of each of the following functions. Do **Not** Simplify.

1. $f(x) = \frac{4}{x^5} - \frac{5}{4x} - \frac{4}{5} + \frac{1}{4\sqrt{x}}$
2. $y = \left(x^2 + 5x\right)^4$
3. $y = \frac{1}{\left(x^2+5x\right)^4}$
4. $y = \frac{1}{\sqrt{x^3 - 9x + 3}}$
5. $y = \left(\frac{1}{x^3} + 7x\right)^{\frac{5}{7}} \left(x^4 - \frac{1}{x^7}\right)^{-5}$

6. Compute the equation of the Tangent Line to $y = 6\sqrt{2x+7}$ at the point where $x = 1$. Simplify.

7. Graph the function $y = \sin x$ on the interval $[0, 2\pi]$. Determine the following values:

$\sin 0 \quad \sin\frac{\pi}{2} \quad \sin\pi \quad \sin\frac{3\pi}{2} \quad \sin 2\pi$

8. Graph the function $f(x) = \cos x$ on the interval $[0, 2\pi]$. Determine the following values:

$\cos 0 \quad \cos\frac{\pi}{2} \quad \cos\pi \quad \cos\frac{3\pi}{2} \quad \cos 2\pi$

9. Make a chart of the Trig. Values for sine, cosine and tangent for all angles $\theta = 0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$

For $\#10-15$, compute the following values. Justify. Show work using Unit Circle and Trig Triangles.

10. $\cos\frac{2\pi}{3}$
11. $\sin\frac{5\pi}{3}$
12. $\sin\frac{7\pi}{6}$
13. $\cos\frac{5\pi}{4}$
14. $\sin\frac{5\pi}{6}$

For $\#15-16$, find the equation of the tangent line to $f(x)$ at the given x-value. Simplify.

15. $f(x) = \sin x$ at $x = 0$
16. $f(x) = \cos x$ at $x = \frac{\pi}{6}$

For $\#17-20$, compute the Derivative for the following functions. Do **Not** Simplify.

17. $y = \frac{1}{x} - 2\cos x - \sin x$
18. $f(x) = \sqrt{x} \cdot \sin x$
19. $f(x) = \cos x \cdot \sin x$
20. $f(x) = \frac{\cos x}{x^2+3}$

REGULAR OFFICE HOURS

Monday: 1:00–3:00 pm

Tuesday: 12:00–4:00 pm

Wednesday: 1:00-3:00 pm

Friday: 12:00–2:00 pm

Math Fellow evening TA Help Hours TBD soon

- Please take the time to read over your class notes this week.
- Work towards full understanding of the Trig concepts and not just the numbers and formulas.