

Submit your solution to this test to Canvas as a clearly readable pdf file on the date stated above before class (5% of your final grade).

You will need to scan your answers to a pdf file, each solution page on a separate page in the pdf. Then submit that pdf file to Canvas as the solution for this test.

If your pdf is not clearly readable or excessively large, you will be required to resubmit until it is acceptable.

I am informed that many students succeed in creating clearly readable pdf files using their mobile phone with the *cam scanner* software. Consider making a “scanner box.” Make very sure there is plenty of light on the paper. Make each homework page cover the entire screen.

Whatever you use, the pdf of your work must be very clearly readable. But do not use excessive “resolution” or “jpeg quality”. Resolution should be about 150 to 200 dots per inch. Jpeg quality should be whatever is listed as medium to slightly higher quality. If you are not using a flatbed scanner, keep your camera horizontal above the horizontal homework page, make sure that there is plenty of light on the page, and make the letter size page fill the entire picture. Scan either to color or grey scale, never to black & white.

Read carefully. And look it up. Answer questions in order from left to right, top to bottom. You must work alone. You probably want to consult a math handbook.

Neatly draw the graph of the following functions, showing the locations of 0 and ± 1 on each axis. Give the derivative. Indicate non-principal values as a broken line. Make sure that you give enough of the curves to *clearly* demonstrate *all* features (like periodicity, asymptotic behavior, multiple valuedness, etcetera). *Make sure that you have answered all parts, including derivatives.*

1) $x - 2$

2) $x^2 - 4$

3) $x^3 - x$

4) $\sin(x)$

5) $\arcsin(x)$

6) $\sinh(x)$

7) $\cos(x)$

8) $\arccos(x)$

9) $\cosh(x)$

10) $\tan(x)$

11) $\arctan(x)$

12) $\tanh(x)$

13) $\ln(x)$

14) e^x

15) $\sin(\pi x^2)$

Find (include any integration constants and absolute signs):

16) $\int x^{-2} dx =$

17) $\int_1^2 x^{-2} dx =$

18) $\int_1^x \xi^{-2} d\xi =$

19) $\int \frac{dx}{x} =$

20) $\int \frac{1}{1-x^2} dx =$

21) $\int \frac{1}{1+x^2} dx =$

22) $\int \ln(x) dx =$

23) $\int x e^x dx =$

24) $\int x e^{x^2} dx =$

25) $\begin{vmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 1 \end{vmatrix} =$

26) $\lim_{x \rightarrow 0} \frac{\sin(x)}{x} =$

27) $\frac{d}{dx} \int_0^x \frac{\sin(x\xi)}{\xi} d\xi =$

28) $1 + 2 + 3 + 4 \dots + 1000 =$

29) $x + x^2 + x^3 + x^4 + \dots =$

30) Solve: $\frac{dy}{dx} = -y$ $y(0) = 1$