ACMAT161 Summer 2024
Professor Manguba-Glover
Homework 20 Name: _____

Show all work, simplify, and box your answers. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

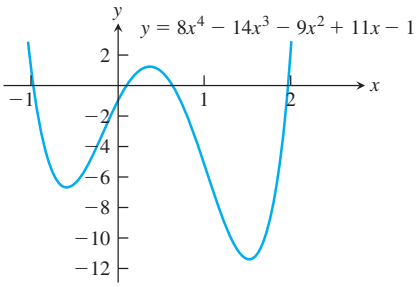
Due next class. Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

1. Use Newton's method to estimate the solutions of the equation $x^2 + x - 1 = 0$. Start with $x_0 = -1$ for the left-hand solution and with $x_0 = 1$ for the solution on the right. Then, in each case, find x_2.

2. Find the approximate values of r_1 through r_4 in the factorization.

$$8x^4 - 14x^3 - 9x^2 + 11x - 1 = 8(x - r_1)(x - r_2)(x - r^3)(x - r_4)$$

In other words, use Newton's Method four times to find the four roots of $f(x) = 8x^4 - 14x^3 - 9x^2 + 11x - 1$.



3. Evaluate $\int \left(\frac{1}{x^2} - x^2 - \frac{1}{3}\right) dx$

4. Evaluate $\int \left(3\cos x - \frac{17}{\cos^2 x}\right) dx$

5. Evaluate $\int \left(\frac{9}{x} - 3e^x\right) dx$

6. Evaluate $\int \left(\frac{\sqrt{x}}{2} + \frac{2}{\sqrt{x}}\right) dx$

7. Evaluate $\int x^{-3}(x+1)\, dx$

8. Evaluate $\int \frac{t\sqrt{t} + \sqrt{t}}{t^2}\, dt$

9. Solve the initial value problem $\frac{dy}{dx} = \frac{1}{2\sqrt{x}}$, $y(4) = 0$

10. Solve the initial value problem $\frac{d^3y}{dx^3} = 6$; $y''(0) = -8$, $y'(0) = 0$, $y(0) = 5$