

AP:

Homework
11/13-11/21

due: Tuesday: read pp. 212-214

1. Graph $f(x) = x^4 - 6x^2 + 2$ by making a table of values for $f(x)$, $f'(x)$, and $f''(x)$.
2. Let f be a function that is continuous on $[-2,3]$ such that $f'(0)$ does not exist, $f'(2) = 0$, and $f''(x) < 0$ for all x except $x = 0$. Draw a possible graph of $y = f(x)$.
3. Consider the function f defined by $f(x) = (x^2 - 1)^3$ for all real numbers x .
 - a. For what values of x is the function increasing?
 - b. Find the x - and the y -coordinates of all relative extrema. Justify your answer.
 - c. For what value(s) of x is the graph of $y = f(x)$ concave upward?
 - d. Using the information found in parts a., b., and c, sketch $y = f(x)$.

Wednesday: review sheet

on: Thursday: test

due: Monday: read pp. 200-201

- Evaluate:
- | | |
|----------------------------|---|
| 1. $\int x^3 dx$ | 6. $\int x^{-1/3} dx$ |
| 2. $\int 7 dx$ | 7. $\int (1 - 4x^{-3}) dx$ |
| 3. $\int (x + 1) dx$ | 8. $\int (5x^2 + 2x) dx$ |
| 4. $\int 3\sqrt{x} dx$ | 9. $\int \left(2x^3 - 5x + \frac{7}{x^5}\right) dx$ |
| 5. $\int \frac{4}{x^2} dx$ | 10. $\int (1 - x^2 - 3x^5) dx$ |

Tuesday: read pg. 334

- Evaluate:
- | | |
|---------------------------------------|--|
| 1. $\int 28(7x - 2)^3 dx$ | 4. $\int (y^4 + 4y^2 + 1)^7 (y^3 + 2y) dy$ |
| 2. $\int 5x^3 (x^4 - 1)^2 dx$ | 5. $\int (x^2 + 7)^2 dx$ |
| 3. $\int \frac{x^2 dx}{\sqrt{1-x^3}}$ | |

Monday: read pp. 321-322

1. Solve each differential equation with the given conditions:
 - a. $\frac{dy}{dx} = 3x^2 + 2x + 1$; $y = 0$, $x = 1$
 - b. $\frac{dy}{dx} = \frac{-5}{x^2}$; $y = 3$, $x = 5$
2. Find the general solution of each differential equation:
 - a. $\frac{dy}{dx} = 5 - 3x$
 - b. $\frac{dy}{dx} = (x - 1)(x + 3)$
3. If f is a function such that $f'(x) = \frac{1}{x^2}$ and $f(1) = 3$, find $f(2)$.
4. If $\frac{dy}{dx} = 3x^2$ and $y = 3$ when $x = 2$, find y when $x = 3$.
5. Find the curve in the xy plane that passes through the point $(9,4)$ and whose slope at each point is $3\sqrt{x}$.