

1. Do WebAssign 10.3. Again, start with the WebAssign.

2. Find the first four nonzero terms of the Taylor Series about the origin of

$$A(s) = \frac{s^2}{\sqrt{1-s^2}}$$

3. Let $f(0) = 1$ and $f^{(n)}(0) = \frac{(n+1)!}{2^n}$ for $n > 0$.

Write the Taylor series for f at $x = 0$ using sigma sum notation and simplify the general term.

Does the series you found in part (a) converge for $x = 3$? Briefly explain your reasoning.

Make the assumption (which is sometimes, but not always, true) that $\int(\sum a_n x^n)dx = \sum(\int a_n x^n dx)$ to use the series you found above to evaluate

$$\int_0^1 f(x) dx.$$

4. Find the first four nonzero terms of the Taylor Series about the origin of

$$f(z) = z^2 e^z + 1$$

5. The table gives values of $f^{(n)}(0)$ where f is the inverse hyperbolic tangent function.

n	1	2	3	4	5	6	7
$f^{(n)}(0)$	1	0	2!	0	4!	0	6!

Find the Taylor polynomial of degree 7 for f about $x = 0$.

Assuming the pattern in the table continues, write the Taylor series for this function.

6. Solve exactly for the variable x .

$$x - \frac{1}{2}x^2 + \frac{1}{3}x^3 + \dots = 0.5$$

Differential Equations

Section 11.1
November 18, 2016

Name:
Math 129 - 01

Understand	Know that a differential equation is an equation with terms involving the derivatives of y .
Understand	Be able to verify a solution to a differential equation by checking LHS = RHS.
Understand	Identify the 'order' of a differential equation.
Understand	Know why the general solution to an ordinary equation has arbitrary constants.
Apply	Know how many arbitrary constants a differential equation should have.

1. We would like to test whether $y(x) = Ax^2$ is a solution to the differential equation $xy' - 3y = 0$

For the function $y(x) = Ax^2$, compute $y'(x)$.

Substitute $y(x)$ and $y'(x)$ to simplify the left hand side of the equation.

Does LHS = RHS? If not, then $y(x) = Ax^2$ is not a solution to the differential equation

2. We would now like to test whether a new function, $y(x) = Bx^3$ is a solution to the differential equation $xy' - 3y = 0$.

For the function $y(x) = Bx^3$, compute $y'(x)$.

Substitute $y(x)$ and $y'(x)$ to simplify the left hand side of the equation.

Does LHS = RHS? If so, then $y(x) = Bx^3$ is a solution to the differential equation

Quiz (Leave this space blank)