

MAP 2302 WRITTEN HOMEWORK #1

Due Tuesday September 3rd, in Canvas

Question 1. Find a solution to the differential equation.

$$xy' = 17y$$

(Hint: Try a 'power function' of the form $y = x^r$ where r is a constant.)

Question 2. Consider the following differential equation.

$$y'''' = y$$

Note: In case it's hard to read, y'''' is the fourth derivative. This is also sometimes written as $y^{(4)}$ or $\frac{d^4 y}{dx^4}$. So in this case, we're looking for functions whose fourth derivative is equal to the original function.

Which of the following are solutions to the differential equation?

- (i) $y = \sin x$
- (ii) $y = \cos x$
- (iii) $y = e^x$
- (iv) $y = \ln x$
- (v) $y = x^4$
- (vi) $y = 17 \sin x + 83 \cos x - 221e^x$