Exercise sheet 3 for Math 263: ODEs for Engineers   Matt Roberts
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1. Solve $y' = \frac{x^3 + 2y^3}{xy^2}$.

2. Solve $y' = xy - xy^3$.

3. Let $L_1(y) = \frac{dy}{dx}$ and $L_2(y) = \frac{y}{x}$.
   a) What is $L_1(4)$?
   b) What is $L_2(4)$?
   c) What is $L_1 L_2(4)$?
   d) What is $L_2 L_1(4)$?
   e) What is $L_1 L_2(x^2)$?
   f) What is $L_2 L_1(x^2)$?

4. Which of the following are linear operators?
   a) $L(y) = 3y$
   b) $L(y) = y \sin x$
   c) $L(y) = \sin y$
   d) $L(y) = \frac{d^2 y}{dx^2}$
   e) $L(y) = x(2y + x\frac{dy}{dx})$
   f) $L(y) = \frac{d}{dx}(x^2 y)$

If you spot any errors, please inform me: `matthew.roberts@mcgill.ca`