

# Solutions to Midterm I

$$1a) \quad y = x \tan(\log|x| + C)$$

$$1b) \quad y = \frac{1}{2x} \log|c - x^2|$$

$$2a) \quad P_1 \equiv 1, \quad P_2 \equiv 3$$

$$2b) \quad P(t) = \frac{1 + 3e^{-2t}}{1 + e^{-2t}}$$

$$2c) \quad \lim_{t \rightarrow \infty} P(t) = 1$$

$$3) \quad t = \frac{m}{K} \log 10$$

$$4a) \quad x(t) = t + 20 - 4000(t + 20)^{-2}$$
$$x(30) = 50 - \frac{8}{5}$$

$$4b) \quad \lim_{t \rightarrow \infty} \frac{x(t)}{V(t)} = 1$$

$$5) \quad Y_3 = 4$$