

Answers to Practice Problems for Midterm III

1. (a)  $x = \ln(6) \left( = \frac{\log(6)}{\log(e)} \right)$

(b)  $x = \frac{2 \log(7)}{5 \log(8) - \log(7)}$

(c)  $x = K(3 - \log_2(A)) \left( = \frac{K(\log(8) - \log(A))}{\log(2)} \right)$

2. (a) 3 grams

(b) mass of the isotope in  $t$  years  $= 12 \left( \frac{1}{2} \right)^{\frac{t}{3}}$

(c) 12 years

3. (a) (i) 5, (ii) 4.5, (iii) 4.1

(b)  $f'(t) = 2t + 2$

(c)  $f'(1) = 4$

(d)  $t = .5$

4. (a)  $f'(x) = 9x^2 + 4x$

(b)  $f'(x) = -\frac{3}{5}x^{-\frac{8}{5}}$

(c)  $f'(x) = 6e^{2x}$

(d)  $f'(x) = \frac{1}{2\sqrt{x}} - \frac{1}{2x^{\frac{3}{2}}}$

5.  $y = 7x - 3$

6.  $e^{1.2} \approx 1.2e$

7. 6 degrees/hour