

## Sample Midterm

**Problem 1.** If \$3,000 are deposited into an account paying 8% compounded daily, and at the same time, \$5000 are deposited into an account earning 5% compounded daily, will the first account be worth more than the second. If so, when?

**Solution:** Yes, after 6217 days

**Problem 2.** The World Health Organization estimated that there were 3.1 million deaths worldwide from HIV during 2004. Assuming that the number continues to grow at a relative rate of 4.3%, compounded continuously, estimate the number of deaths from HIV in

(a) 2008

(b) 2012

**Solution:** (a) 3.7 million, (b) 4.4 million

**Problem 3.** (a) Solve the equation:  $x^{\log x} = 100x$ .

(b) Solve:  $1 + \ln(x + 1) = \ln(x - 1)$ .

**Solution:** (a) 100 and 0.1, (b) No solution

**Problem 4.** (a) Find the radian expression of

i)  $64^\circ$ , ii)  $25^\circ$ , iii)  $108.143^\circ$

(b) Find every possible  $x$  such that  $W(x) = (1/\sqrt{2}, -1/\sqrt{2})$

**Solution:** (b)  $7\pi/4 + 2k\pi$ .

**Problem 5.** Find the degree measure to one decimal place of the acute angle between the line

$$12y - 4x + 3 = 0$$

and the  $x$ -axis.

**Solution:**  $18.4^\circ$ .