

ÇANKAYA UNIVERSITY  
DEPARTMENT OF MATHEMATICS  
December 13, 2005

Math 109  
Business Mathematics  
Second Midterm

Duration: 90 min.  
Show all your work.

1. (15 pts.) How much should new parents invest now at 8% compounded semiannually to have \$80,000 toward their child's college education in 17 years?

2. (15 pts.) What is the value of an annuity at the end of 10 years if \$1,000 is deposited every 6 months into an account earning 8% compounded semiannually? How much of this value is interest?

3. (15 pts.) How much should you deposit in an account paying 8% compounded quarterly in order to receive quarterly payments of \$1,000 for the next 4 years?

4. (20 pts.) Find the limits

$$(a) \lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x^2 - 9} \quad \text{and} \quad (b) \lim_{x \rightarrow 2^+} |x - 2|$$

5. (20 pts.) Let

$$f(x) = (2x - 9)(x^2 + 6)$$

- (a) Find the equation of the line tangent to the graph of  $f(x)$  at  $x = 3$ .
- (b) Find the value(s) of  $x$  where the tangent line is horizontal.

6. (15 pts) Which is the better investment and why: 9% compounded monthly or 9.3% compounded annually?