8. [6 points] Consider the following graph of two functions with their formulas given. The letters A, B, r, p are all constants.



Compare the two quantities given by putting one of the symbols ">", "<", or "=" in the blank provided. If the relationship between the quantities cannot be determined, write "N" in the blank. You do not have to show your work.

- (i)  $A \_ B$ (ii)  $r \_ p$ (iii)  $\lim_{x \to \infty} A(1+r)^x \_ \lim_{x \to \infty} B(1+p)^x$
- **9.** [10 points] Suppose L(t) is a linear function, Q(t) is a quadratic function, and E(t) is an exponential function, each with domain all real numbers. Also, assume that E(3) = 1. For each of the following statements, circle the correct option.

**a**. [2 points] The graphs of E(t) and L(t) intersect exactly once.

must be true	could be true	never true

**b**. [2 points] E(-1) is negative.

must be true could be true never true

c. [2 points] The graphs of Q(t) and L(t) intersect exactly twice.

must be true	could be true	never true

**d**. [2 points] The graph of E(t) is concave up.

must be true could be true never true

e. [2 points] The graphs of Q(t) and Q(t+2) - 5 intersect exactly twice.

must be true could be true never true