Name ________________________________ Honors Pre-Calculus Test
June 3, 2002 Sections 9.6, 9.7, 9.4, 10.3

Part A. Limits

1. 1/3

2. 7

3. –1

4. 3/4

5. 1

Part B. Sequences

1. **a.** $t_n = 7 + (-3)(n - 1)$ or $t_n = 10 - 3n$

b. $t_n = 64 \cdot (\frac{1}{2})^{n-1}$ or $t_n = 128 \cdot (\frac{1}{2})^n$

c. $t_n = 3^{(2^n)}$ or $t_n = 9^{(2^{n-1})}$

2. **a.** 0, 1, 3, 6, 10, 15

b. $I_n = I_{n-1} + (n - 1)$, because the nth line added intersects each of the existing $(n - 1)$ lines once.

c. This sequence (except for the 0 at the beginning) is the sequence of *triangular numbers* that appeared in problems such as 9.2 #35 and 9.4 #76. Those problems show two different methods of proving that $I_n = T_{n-1} = \frac{(n-1)n}{2}$. Either way was acceptable here.

Part C. Series

1. $\dfrac{n(t_1 + t_n)}{2} = \dfrac{98(-8 - 493)}{2} = -24549.$

2. $\dfrac{a(1 - r^n)}{1 - r} = \dfrac{\frac{3}{4}(1 - (\frac{8}{9})^{10})}{1 - \frac{8}{9}} \approx 4.67.$

3. Each square has half the area of the previous square. The sum of the areas turns out to be this infinite geometric series: $16 + 8 + 4 + 2 + 1 + \cdots = 32$.

Part D. Statistics

1. Boxplot using the values 0.6, 2.3, 2.95, 3.7, 5.0.

2. Many possible answers; check your answer using “1-Var Stats” on your calculator.