Exam 3 Review (Problems)

1. Find the limit of the sequence and state-whether the sequence converges or diverges

   $a_n = \left(1 + \frac{1}{n}\right)^n$

2. Find the limit of the sequence and state-whether the sequence converges or diverges

   $a_n = 2 + (-1)^n$

3. Find the limit of the sequence and state-whether the sequence converges or diverges

   $a_n = \frac{n}{n+1}$

4. Write the nth-term formula for the following sequences

   1. $3, 7, 11, 15, \ldots$
   2. $2, -1, \frac{1}{2}, -\frac{1}{4}, \ldots$
   3. $1, x, \frac{x^2}{2}, \frac{x^3}{6}, \frac{x^4}{24}, \frac{x^5}{120}, \ldots$

Exam 3 Review (Answers)

1. *(Section 9.1—9.3)*

   $e, \therefore$ converges

   (definition of e)

2. *(Section 9.1—9.3)*

   the limit does not exist, $\therefore$ diverges

3. *(Section 9.1—9.3)*

   $1, \therefore$ converges

4. *(Section 9.1—9.3)*

   1. $a_n = 4n - 1$
   2. $a_n = (-1)^{n+1} 2^{2-n}$
   3. $a_n = \frac{x^{n-1}}{(n-1)!}$