Section 11.1: Additional Problems

1. Find a general formula for the sequence. Assume the start fo the sequence is $n = 1$.
   $\left\{1, \frac{6}{4}, \frac{9}{5}, 2, \frac{15}{7}, ...\right\}$
2. Find a general formula for the sequence. Assume the start fo the sequence is $n = 1$.
   $\left\{\frac{-1}{3}, \frac{2}{5}, \frac{5}{7}, \frac{8}{9}, 1, \frac{14}{13}, ...\right\}$
3. Does the sequences converge or diverge? If it converges, give the value.
   $\left\{\arcsin\left(\frac{2n}{4n+5}\right)\right\}$
4. Does the sequences converge or diverge? If it converges, give the value.
   $a_n = 5 - \left(\frac{\pi+4}{e^2}\right)^n$
5. Does the sequences converge or diverge? If it converges, give the value.
   $\left\{\frac{n^2}{2n-1} - \frac{n^2}{2n+1}\right\}$
6. Does the sequences converge or diverge? If it converges, give the value.
   $a_n = \sqrt[n]{3^{2n+5}}$.
7. Determin if the sequence is bounded and if the sequence is increasing or decreasing or not monotonic.
   $a_n = 7 - \frac{4}{n^2}$.
8. Determine whether thesequence is increasing, decreasing, or not monotonic.
   $a_n = \frac{\sqrt{n-3}}{5n+8}$ for $n \geq 8$
9. Does the sequences converge or diverge? If it converges, give the value.
   $a_n = \frac{(-5)^n}{2^{3n}}$
10. Does the sequences converge or diverge? If it converges, give the value.
    $a_n = \frac{(-1)^n(n^2+1)}{3n^3+5} + \frac{3n}{5n+7}$
11. Does the sequences converge or diverge? If it converges, give the value.

    $\left\{\frac{2^n}{n^2}\right\}$

12. Does the sequences converge or diverge? If it converges, give the value.
    $\left\{\frac{(-3)^n}{n!}\right\}$
13. Assume that the sequence is decreasing and bounded. Determine if the sequence converges. If it converges, give the value.
    $a_1 = 2 \qquad a_{n+1} = \frac{1}{3 - a_n}$

14. Assume that the sequence converges. Give the value.

$a_1 = 3 \qquad a_{n+1} = \dfrac{(a_n)^2 + 6}{4a_n}$