Problem 1. Sequences Section #4

Find the first six terms of each of the following sequences, starting with $n = 1$.

We have $a_1 = 1$, $a_2 = 1$ and $a_{n+2} = a_n + a_{n+1}$ for $n \geq 1$.

The first six terms are $\boxed{1, 1, 2, 3, 5, 8}$.

Problem 2. Sequences Section #6

Find a formula a_n for the nth term of the arithmetic sequence whose first term is $a_1 = 1$ such that $a_{n-1} - a_n = 17$ for $n \geq 2$.

Here we have $a_n - a_{n-1} = -17$. Therefore, the formula for a_n is $\boxed{a_n = -17n + 18}$.

Problem 3. Sequences Section #8

Find a formula a_n for the nth term of the geometric sequence whose first term is $a_1 = 1$ such that $\frac{a_{n+1}}{a_n} = 10$ for $n \geq 1$.

The formula for a_n is $\boxed{a_n = 10^{n-1}}$.

Problem 4. Sequences Section #10

Find an explicit formula for the nth term of the sequence whose first several terms are $\{0, 3, 8, 15, 24, 35, 48, 63, 80, 99\}$.

The formula for a_n is $\boxed{a_n = n^2 - 1}$.

Problem 5. Sequences Section #12

Find a formula for the general term a_n each of the following sequences.

The first few terms are $\{1, 0, -1, 0, 1, 0, -1, 0, ...\}$, which correspond to

$\{\sin(\frac{\pi}{2}), \sin(\frac{3\pi}{2}), \sin(\frac{4\pi}{2}), \sin(\frac{5\pi}{2}), \sin(\frac{6\pi}{2}), \sin(\frac{7\pi}{2}), \sin(\frac{8\pi}{2}), ...\}$.
The formula for a_n is $\boxed{a_n = \sin(\frac{n\pi}{2})}$.

Problem 6. Sequences Section #14

Find a function $f(n)$ identifies the nth term a_n the following recursively defined sequences, as $a_n = f(n)$.

We have $a_1 = 1$ and $a_{n+1} = -a_n$ for $n \geq 1$.

The function is $\boxed{f(n) = (-1)^{n-1}}$.

problemSequences Section #16

Find a function $f(n)$ identifies the nth term a_n the following recursively defined sequences, as $a_n = f(n)$.

We have $a_1 = 1$ and $a_{n+1} = (n+1)a_n$ for $n \geq 1$.

The function is $\boxed{f(n) = n!}$.