



## Problem 6. «Toy cipher cryptanalyst»

Bob is a beginner in cryptography and, for fun, he makes cryptanalysis for toy versions of various ciphers. One of his functions written in C++ is below.

```
uint32_t foo(uint32_t x) {
    uint32_t y = 0x20000000;
    for (uint32_t i = 0x40000000; i != 0x80000000; ++i) {
        if (x == y)
            return i;
        y = y + ((i << 2) >> 1) + (i >> 30) + 1;
        y = ((y << 1) >> 1) + (y >> 31);
    }
    return 0x80000000;
}
```

What is the purpose of this function? Is there anything that needs to be fixed in this function? Please provide as many details as possible in your answers.

