Practice Exam 2

(1) Let F_n represent the nth Fibonacci number. What is $F_3 \times F_6$? (recall $F_0 = 0, F_1 = 1, F_2 = 1, \dots$)

(2) What is $[1, 3, 1]$ as a fraction in lowest terms? (recall $[1, 3, 1]$ is continued fraction notation)

(3) What is $\phi(3 \times 11 \times 17)$?

(4) Use the extended Euclid's Algorithm to find $gcd(25, 33)$ as well as x, y such that $25x + 33y = gcd(25, 33)$?

(5) What is $(16^2 + 11^2 + 6^2) \bmod 5$ equal?

(6) If the following are the first 11 digits of a bar code, what is the 12th (or check) digit?

1 1 2 2 3 4 3 2 2 1 1

(7) What does $2^{22} \bmod 11$ equal? What is $\phi(11)$?

(8) What is $\phi(26) = \phi(2 \times 13)$ and what does $5^{49} \bmod 26$ equal?

(9) Which of the following are rational?

$$\sqrt{2 \cdot 5},\ \sqrt{2 \cdot 5^2},\ \sqrt{2^2 \cdot 5},\ \sqrt{2^2 \cdot 3^2 \cdot 5^2}$$

(10) What is $0.\overline{27} = 0.2727\dots$ as a fraction in lowest terms?

For the next problem consider the following substitution code

A	B	C	D	E	F	G	H	I	J	K	L	M
$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$
T	H	E	Q	U	I	C	K	B	R	O	W	N
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$
F	X	J	M	P	D	V	L	A	Z	Y	G	S

(11) What do you get when you encode the phrase

FINISHED!