LaTeX tutorial

Your name here

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(a) Use summation notation, i.e. $\sum_{i=1}^{n}$, to rewrite the following expression without ellipses:

$$1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \cdots =$$

Do you know what the value of this sum is?

(b) The quadratic formula gives an explicit expression for the solutions to an equation $ax^2 + bx + c = 0$. Typeset the quadratic formula below.

(c) Typeset the following sentence symbolically: "For every x, if x is bigger than 1 then x is bigger than 0." Hint: detexify [`http://detexify.kirelabs.org/`] could help you find the LaTeXcode for the "for all" symbol, and "implies" etc.

(d) Solve this congruence:

$$3x + 2 \equiv 2x + 1 \pmod{10}$$

Write the steps of your computation neatly using the `align` environment:

$$\begin{aligned} 3x + 2 &\equiv 2x + 1 \pmod{10} \\ 3x + 2 &\equiv 2x + 1 \pmod{10} \end{aligned}$$

(e) Typeset an example of matrix multiplication. You might find the course website Mini Introduction to LaTeX [`http://crypto.katestange.net/sample-page-2/`] page useful.

(f) Fill in the rest of this multiplication table modulo 5:

	0	1	2	3	4
0	0	0	0	0	0

(g) Now typeset a multiplication table modulo 4:

(h) Finish this Caesar Cipher:

plaintext : `goodbye`

ciphertext : `hp`

(i) Now typeset an example of the use of Vigenère cipher, using similar formatting.

(j) Typeset the statement of Fermat's Little Theorem using the `theorem` environment (you may wish to look it up in Wikipedia [`http://en.wikipedia.org`]. Then typeset an example using the prime 5.

(k) Compute a few of the sums in the following sequence:

$$1,\ 1+3,\ 1+3+5,\ 1+3+5+7,\ 1+3+5+7+9,\ \ldots$$

Do you see a pattern? Write a formula expressing the pattern you found.