

# L<sup>A</sup>T<sub>E</sub>X Assignment 1

YOUR NAME HERE

Due Friday January 17, 2014 by 5:00 pm in JWB 228

## Instructions

Typeset this entire document using L<sup>A</sup>T<sub>E</sub>X and print your PDF on paper. This assignment is due in my mailbox in JWB 228 (the teachers' lounge) by 5:00 pm on Friday 1/17. Make sure that you change the `\author{YOUR NAME HERE}` command above to reflect your name. This is how I ensure that you actually typeset the document and do not just print the assignment PDF!

$$1. \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = f'(x)$$

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$$3. \int_a^b f(x) dx = F(b) - F(a)$$

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$$5. \frac{d}{dx} \left[ \int_a^x f(x) dx \right] = f(x)$$

$$6. \sum_{i=1}^n i = \frac{n(n+1)}{2}$$

$$7. \sum_{i=1}^n i^2 = \frac{n(n+1)(2n+1)}{6}$$

$$8. \sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

$$9. e^{ix} = \cos x + i \sin x$$

$$10. V = \begin{pmatrix} 1 & \alpha_1 & \alpha_1^2 & \cdots & \alpha_1^{n-1} \\ 1 & \alpha_2 & \alpha_2^2 & \cdots & \alpha_2^{n-1} \\ 1 & \alpha_3 & \alpha_3^2 & \cdots & \alpha_3^{n-1} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & \alpha_m & \alpha_m^2 & \cdots & \alpha_m^{n-1} \end{pmatrix}$$

$$11. (a + bi) \pm (c + di) = (a \pm c) + (b \pm d)i$$

$$12. (a + bi)(c + di) = (ac - bd) + (ad + bc)i$$

$$13. |(a + bi)| = \sqrt{a^2 + b^2}$$

$$14. \overline{(a + bi)} = a - bi$$

$$15. \overline{(a + bi)}(a + bi) = a^2 + b^2 = |(a + bi)|^2$$

$$16. \sqrt[n]{a} = a^{\frac{1}{n}}$$

$$17. \sqrt[n]{ab} = \sqrt[n]{a} \sqrt[n]{b}$$

$$18. \sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a}$$

$$19. \sqrt[n]{a^n} = \begin{cases} a & \text{if } n \text{ is odd} \\ |a| & \text{if } n \text{ is even} \end{cases}$$

$$20. |a| = \begin{cases} -a & a < 0 \\ a & a \geq 0 \end{cases}$$

21. If  $x^2 + bx + c = 0$ , then

$$x = \frac{-b \pm \sqrt{b^2 - 4c}}{2}.$$