Lambda School LaTeX Equation practice

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Lambda School

Abstract: Italics

1 Background

We need to do math, mostly.

2 Math in LaTeX

1. Basic math There are two canonical ways of creating math in LaTeX: [2] Inline Math:

Let
$$x=1$$
, $5x = 5$

Let
$$x = 1, 5x = 5 \frac{1}{5}$$

Block Math:

$$y = 2$$

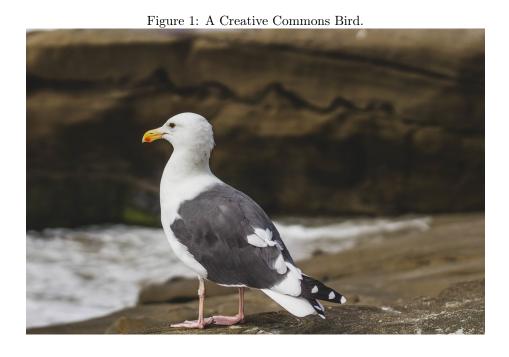
$$x = 1 \quad (1)$$

2. Subscripts and superscripts

$$x^3, x^{\sin(y)}$$

$$x^3, x^{\sin(y)} \end{2}$$

$$x_3, x_{\sin(y)}$$



 $x_3, x_{\sin(y)} \tag{3}$

 $Combine \ subscript \ and \ superscript!$

$$x_j^K i \\ x_j^{Ki+e^{i\pi}} \\ A^{i^{i^{i^i}}}$$

3. Fractions

 $x\frac{e^{i\pi}}{\ln(x)}$

$$x \frac{e^{i\pi}}{\ln(x)}$$

4. More advanced expressions: sums, derivatives, partials, etc

$$\sum_{i=0,k}^{2k} x_i$$
$$\frac{dy}{dx} f(x)$$

$$\sum_{i=0,k}^{2k} x_i \tag{4}$$

Figure 2: A picture of a gull.



5. Matrices, vectors

$$\begin{pmatrix} x \\ y \end{pmatrix} \begin{pmatrix} \Lambda \\ \Gamma \end{pmatrix}$$

$$\begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$$

$$\begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2^{e^{i\pi}} & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$$

$$\begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2^{e^{i\pi}} & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$$
(5)

6. Greek letters

 $\alpha A\beta \eta \zeta$

3 Other skills in LaTeX

1. Figures

Figures are: an image, a caption, a figure #, a subtitle, and the metadata for that stuff.

But did you see my creative commons seagull at Figure 1? See Figure 2.

2. Citations

4 Your Assignment

Write a LaTeX with introduction, background, and the following math expressions:

1.
$$y = f(x)$$

- 2. y = mx + b
- $3. \ dy/dx = nx^{(n-1)}$
- 4. Finite difference
- 5. Vector properties
- 6. Vector magnitude
- 7. L1 norm
- 8. L2 norm
- 9. Matrix multiplication
- 10. Matrix inversion
- 11. Correlation
- 12. SVD and PCA

References

- [1] Donald E. Knuth (1986) $The\ T\!E\!X\ Book,$ Addison-Wesley Professional.
- [2] Leslie Lamport (1994) Lambert TeX: a document preparation system, Addison Wesley, Massachusetts, 2nd ed.