This is a Very Important Title!

(Dated: August 27, 2020)

This abstract is abstract.

If you want to learn more about using LaTeX, you should check UiO's official tutorials: https://www.mn.uio.no/ifi/tjenester/it/hjelp/latex/

If you are familiar with LaTeX and you want to learn more about the REVTeX4-1 document class, check: http://www.physics.csbsju.edu/370/papers/Journal_Style_Manuals/auguide4-1.pdf

I. INTRODUCTION

II. THEORY

III. METHOD

IV. RESULTS

We will now show that

$$FWHM = 2\sqrt{2\ln 2}\sigma$$

The areas

$$(FWHM)\cdot(P(x_1)) = \frac{P(\mu)}{2}\cdot(x_2 - x_1)$$

And since

$$FWHM = x_2 - x_1 \wedge FWHM = 2(\mu - x_1)$$
$$\Downarrow$$
$$P(x_1) = \tfrac{P(\mu)}{2}$$
$$e^{\frac{-(x_1-\mu)^2}{2\sigma^2}} = \tfrac{1}{2}$$
$$-\tfrac{(x_1-\mu)^2}{2\sigma^2} = -\ln 2$$

But we know that

$$-FWHM = 2\left(x_1 - \mu\right)$$

This then means

$$\frac{\left(\frac{1}{2}\left(-FWHM\right)^2\right)}{2\sigma^2} = \ln 2$$
$$FWHM = 2\sqrt{2\ln 2}\sigma \tag{1}$$

We are now going to derive the average energy of a molecule in an ideal gas. We will have use of knowing this integral.

$$\int\limits_0^\infty x^{\frac{3}{2}-x}\,\mathrm{d}x = \frac{3\sqrt{\pi}}{4}$$

V. DISCUSSION

VI. CONCLUSION

ACKNOWLEDGMENTS

I would like thank myself for writing this beautiful document.

REFERENCES

- Reference 1
- Reference 2

Appendix A: mathematical derivations

In this appendix, all of the mathematical derivations for the physical formulas will be.

$$\langle v\rangle = \int\limits_0^\infty v P(v)\,\mathrm{d}v$$

$$\boxed{P(v) = \left(\frac{m}{2\pi kT}\right)^{\frac{3}{2}} e^{-\frac{1}{2}\frac{mv^2}{kT}} 4\pi v^2}$$

$$\langle v\rangle = \int\limits_0^\infty v \left(\tfrac{m}{2\pi kT}\right)^{\frac{3}{2}} e^{-\frac{1}{2}\frac{mv^2}{kT}} 4\pi v^2\,\mathrm{d}v$$

$$\langle v\rangle = 4\pi \left(\tfrac{m}{2\pi kT}\right)^{\frac{3}{2}} \int\limits_0^\infty v^3 e^{-\frac{1}{2}\frac{mv^2}{kT}}\,\mathrm{d}v$$

$$\boxed{x = \frac{1}{2}\frac{mv^2}{kT} \Leftrightarrow v^2 = \frac{2kTx}{m} \Rightarrow v = \sqrt{\frac{2kTX}{m}}}$$

$$\boxed{\frac{\mathrm{d}v}{\mathrm{d}x} = \sqrt{\frac{2kt}{mx}} \Leftrightarrow \mathrm{d}v = \sqrt{\frac{2kT}{mx}}}$$

$$\langle v\rangle = 4\pi \left(\tfrac{m}{2\pi kT}\right)^{\frac{3}{2}} \int\limits_0^\infty \left(\frac{2kTx}{m}\right)^{\frac{3}{2}} e^{-x} \sqrt{\frac{2kT}{mx}}\,\mathrm{d}x$$

$$\langle v\rangle = 4\pi \left(\tfrac{m}{2\pi kT}\right)^{\frac{3}{2}} \left(\frac{2kT}{m}\right)^{\frac{3}{2}} \left(\frac{2kT}{m}\right)^{\frac{1}{2}} \int\limits_0^\infty x^{\frac{3}{2}} x^{\frac{1}{2}} e^{-x}\,\mathrm{d}x$$

$$\langle v\rangle = 4\pi^{1-\frac{3}{2}} \cancel{\left(\tfrac{m}{2kT}\right)}^{\frac{3}{2}} \cancel{\left(\frac{2kT}{m}\right)}^{\frac{3}{2}} \left(\frac{2kT}{m}\right)^{\frac{1}{2}} \int\limits_0^\infty x e^{-x}\,\mathrm{d}x$$

$$\langle v\rangle =$$

$$\langle v\rangle =$$

Next

$$P = \tfrac{1}{3} \tag{A1}$$

Appendix B: This is another appendix

Tada.

Note that this document is written in the two-column format. If you want to display a large equation, a large figure, or whatever, in one-column format, you can do this like so:

This text and this equation are both in one-column format. [1]

$$\frac{-\hbar^2}{2m}\nabla^2\Psi + V\Psi = i\hbar\frac{\partial}{\partial t}\Psi \tag{B1}$$

Note that the equation numbering (this: B1) follows the appendix as this text is technically inside Appendix B. If you want a detailed listing of (almost) every available math command, check: https://en.wikibooks.org/wiki/LaTeX/Mathematics.

And now we're back to two-column format. It's really easy to switch between the two. It's recommended to keep the two-column format, because it is easier to read, it's not very cluttered, etc. Pro Tip: You should also get used to working with REVTeX because it is really helpful in FYS2150.

One last thing, this is a code listing:

```
This will be displayed with a cool programming font!
```

You can add extra arguments using optional parameters:

```
This will be displayed with a cool programming font!
```

You can also list code from a file using `lstinputlisting`. If you're interested, check https://en.wikibooks.org/wiki/LaTeX/Source_Code_Listings.

This is a basic table:

Table I. This is a nice table

Hey	Hey	Hey
Hello	Hello	Hello
Bye	Bye	Bye

You can a detailed description of tables here: https://en.wikibooks.org/wiki/LaTeX/Tables.

I'm not going to delve into Tikz in any level detail, but here's a quick picture:

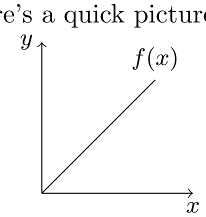

Figure 1. This is great caption

If you want to know more, check: https://en.wikibooks.org/wiki/LaTeX/PGF/TikZ.

[1] This equation is actually from quantum mechanics. "It's called Schrödinger's Time-Dependent Wave Equation", named after the awesome Austrian physicist Erwin Rudolf Josef Alexander Schrödinger. Yep, the "Schrödinger's cat" guy. Pretty cool dude actually, check his wiki page: https://en.wikipedia.org/wiki/Erwin_Schrodinger. He was physics' no. 1 Ladies' man if there ever was one. Anyway, you will learn more about this equation in FYS2140.

You can also find it printed on a glass wall in the UiO Physics Building (it really is that important).