

Goals

By the end of this week, you will:

- Review indices, including fractional and negative, and the index laws
- Use radicals and convert to and from fractional indices
- Understand and use scientific notation and significant numbers



Theoretical Components

Knowledge Checklist:

- Index Laws
- Negative and rational powers

Online Links

Index laws

- <https://www.learninghub.ac.nz/laws-of-indices/>

Significant figures

- <https://www.youtube.com/watch?v=l2yuDvwYq5g>

Practical Components

Resources:

Make notes on the following chapters and websites:

Chapter 5 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 5A Index Laws
- 5B Negative and rational powers

Do the following questions:

Organise your solutions neatly in your exercise book.

Chapter 5 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 5A: 1a, 1d, 2a, 2d, 3a, 3d, 4, 7a, 7e, 8b, 8g, 8h, 10
- 5B: 1, 2-3 (four from each), 4, 5 (any four)

Investigation

See next page

Other

Make sure you are still in the Google Classroom. If you have not, see your teacher.

Fun Fact: Information and cryptographic security is usually measured by how many bits of work is required to defeat a given system. Since a state consisting of n bits has 2^n possible values, quantising bits of work is equivalent to measurement on a base-2 exponential scale. This means that one has to be careful when comparing two cryptosystems of different key sizes: for example, RSA-1024 is not half as secure as RSA-2048, but is actually 2^{1024} times stronger!

Week 1 Investigation

1. Show that $\frac{pq^{-1}-p^{-1}q}{p^2q^{-2}-p^{-2}q^2} = \frac{pq}{p^2+q^2}$

2. Solve for n: $2^{3n+1} = 64$