Week 2 & 3
Term 3
2022

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MM2
Exponential Functions and Graphs

Goals

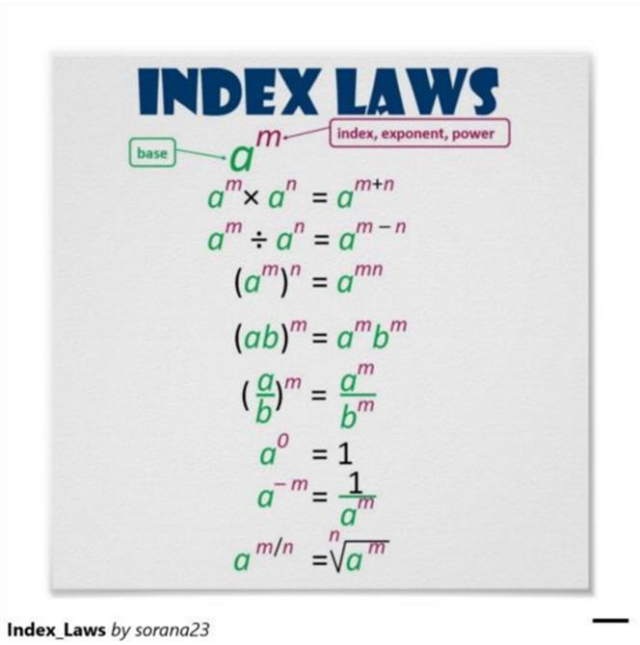
By the end of this fortnight, you should be able to:

- establish and use the algebraic properties of exponential functions
- recognise the qualitative features of the graph of $y = a^x$ $(a > 0)$ including asymptotes, and of its translations $(y = a^x + b \text{ and } y = a^{x+c})$
- identify contexts suitable for modelling by exponential functions and use them to solve practical problems
- solve equations involving exponential functions using technology, and algebraically in simple cases

Theoretical Components

Resources:
Maths Quest 11 Mathematical Methods
Chapter 5 Exponential and Logarithmic Functions (see Google classroom)
Read and make notes:

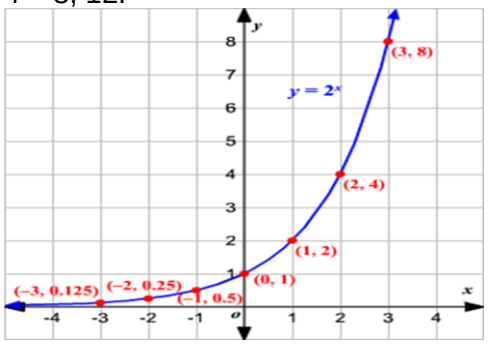
5C Indicial equations
5D Graphs of exponential equations
5H Applications of exponential functions



Practical Components

Complete the following from:
Chapter 5 Exponential and Logarithmic Functions (see Google classroom). Organise your solutions neatly in your exercise book.

Ex 5C Indicial equations
Qs 1 – 4 (any 2 from each), 5a, 9b, 10
Ex 5D Graphs of exponential equations
Qs 1 (a,b), 2 (c,d), 3 (a,h), 4, 5 (any 2)
Ex 5H Applications of exponential functions
Qs 1, 2, 4 – 8, 12.



https://mathspace.co/student/tasks/TopicCustomTask-569356/

Investigation

See the following page for **Week 2**

And work on your assignment for **Week 3**

QFO

Check hawkermaths.com for each week's learning brief as well as GC.

Check-in with your teacher every lesson.

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MM2 Investigation Week 2

Some equations involving powers or indices can be solved using logarithms… but not all.

The example below illustrates how to solve an indicial equation using logarithms.

WORKED EXAMPLE 22

Solve for x correct to 3 decimal places, if $2^x = 7$.

THINK	WRITE
1 Write the equation.	$2^x = 7$
2 Take $\log_{10}$ of both sides.	$\log_{10}(2^x) = \log_{10}(7)$
3 Use the 'logarithm of a power' law to bring the power, x, to the front of the logarithmic equation.	$x \log_{10}(2) = \log_{10}(7)$
4 Divide both sides by $\log_{10}(2)$ to get x by itself.	Therefore $x = \dfrac{\log_{10}(7)}{\log_{10}(2)}$
5 Evaluate the logarithms correct to 4 decimal places, at least one more than the answer requires.	$x = \dfrac{0.8451}{0.3010}$
6 Solve for x.	$x = 2.808$

Summary: If $b^x = N$, then $x = \dfrac{log_a(N)}{log_a(b)}$

Note: The log button  on your scientific calculator is log_{10} ("log base 10").

The following equations can be solved using indices or logarithms. For each:

- state whether it can be solved using indices, or must be solved using logarithms, then proceed to solve.

$3^x = 81$	$x^5 = 50$
$3^x = 43$	$6^{2x-1} = 2$
$3^{2x} - 3 = 24$	$16^{\frac{3}{x}} = 10$