Units 5 & 6: Chapters 4 & 5

sequences & exponential functions

Cornell Notes/Summary Sheet

Name: _____

Period: _____

Chapter 4 – Big Ideas

- What is a sequence?
- Term in a sequence
- Infinite sequence
- Finite sequence
- Arithmetic sequence
- Common difference, d
- Geometric sequence
- Common ratio, r
- Explicit formula for an arithmetic sequence
- Explicit formula for a geometric sequence
- Recursive formula for an arithmetic sequence
- Recursive formula for a geometric sequence

Your Notes

PROPERTIES OF EXPONENTS

product rule

$$a^m \cdot a^n = a^{m+n}$$

$y \cdot y^6 = y^{1+6} = y^7$

power rule

$$(a^m)^n = a^{mn}$$

$(x^2)^3 = x^{2 \cdot 3} = x^6$

power of a product rule

$$(ab)^m = a^m b^m$$

$(xy)^4 = x^4 y^4$

quotient rule

$$\frac{a^m}{a^n} = a^{m-n}$$

$\frac{x^5}{x^2} = x^{5-2} = x^3$

power of a quotient rule

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

$\left(\frac{x}{y}\right)^5 = \frac{x^5}{y^5}$

zero exponent

$$a^0 = 1$$

negative exponents

$$a^{-m} = \frac{1}{a^m} \quad \& \quad \frac{1}{a^{-m}} = a^m$$

$2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

Be careful w/negative exponents:

$\frac{-2}{w^{-3}} = -2w^3$

This negative is not effected!

This is a trick that works just for negative exponents!

Let's look at these as fractions...

$\frac{w^{-3}}{1} = \frac{1}{w^3}$ and $\frac{1}{x^{-2}} = \frac{x^2}{1}$

Lesson 5.1 – Big Ideas	**Your Notes**
• Simple interest function • Rate of change & graph of a simple interest function • Compound interest function • Rate of change & graph of a compound interest function	

Lesson 5.2 – Big Ideas	**Your Notes**
• Equations for population problems • Increasing vs. decreasing exponential functions • Graphs of exponential functions • Horizontal asymptote • x-intercept & y-intercept • Domain & range	

Lessons 5.3 & 5.4 – Graphing Transformations

	function notation	coordinate notation
VERTICAL TRANSLATIONS		
Shift up	$f(x) = b^x + k$	$(x, y) \rightarrow (x, y + k)$
Shift down	$f(x) = b^x - k$	$(x, y) \rightarrow (x, y - k)$
HORIZONTAL TRANSLATIONS		
Shift right	$f(x) = b^{x-h}$	$(x, y) \rightarrow (x + h, k)$
Shift left	$f(x) = b^{x+h}$	$(x, y) \rightarrow (x - h, k)$
REFLECTIONS		
Horizontal – reflect over x-axis	$f(x) = -b^x$	$(x, y) \rightarrow (x, -1 \cdot y)$
Vertical – reflect over y-axis	$f(x) = b^{-x}$	$(x, y) \rightarrow (-1 \cdot x, y)$

Your Notes