Non-polynomial Functions

EVALUATE RADICAL EXPRESSIONS

SOLVE RADICAL EQUATIONS

CONVERT BETWEEN LOG AND EXPONENTIAL; GRAPH EACH

SOLVE RATIONAL EQUATIONS

GRAPH AND DETERMINE DOMAIN, RANGE, AMPLITUDE, AND PERIOD OF PERIODIC FUNCTIONS

Radical Rules you must know

A $\sqrt[n]{x^m} = x^{\frac{m}{n}}$

B $\sqrt[n]{ab} = \sqrt[n]{a} * \sqrt[n]{b}$

C $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$

D $\sqrt[2]{x^2} = x$

Examples

1. $\sqrt[3]{343}$ (uses rule D)

$=\sqrt[3]{7^3}$

$= 7$

2. $\sqrt{7} * \sqrt{28}$ (Uses rule B & A)

$= \sqrt{196}$

$=14$

3. $\sqrt{4a^2b^4c^3}$ (uses rule D)

$= \sqrt{2^2a^2b^2b^2c^2c}$

$=2ab^2c\sqrt{c}$

4. $Solve$: $\sqrt[6]{2^7} = 2^x$

$x=\frac{7}{6}$

(uses rule A)

Evaluate

5. $f(2) = \sqrt{x+18}$

$= \sqrt{2+18}$

$=\sqrt{20}$

$=2\sqrt{5}$

Solve $6. \sqrt{7x+3} - 8 = 4$

1. Isolate sq rt $\sqrt{7x+3}^2 = 12^2$
2. Square both sides $7x+3=144$
3. Solve $7x=141$
4. Check for extraneous solutions $x=20.1$

You should be able to answer #1 warm up

Exponential and Logs

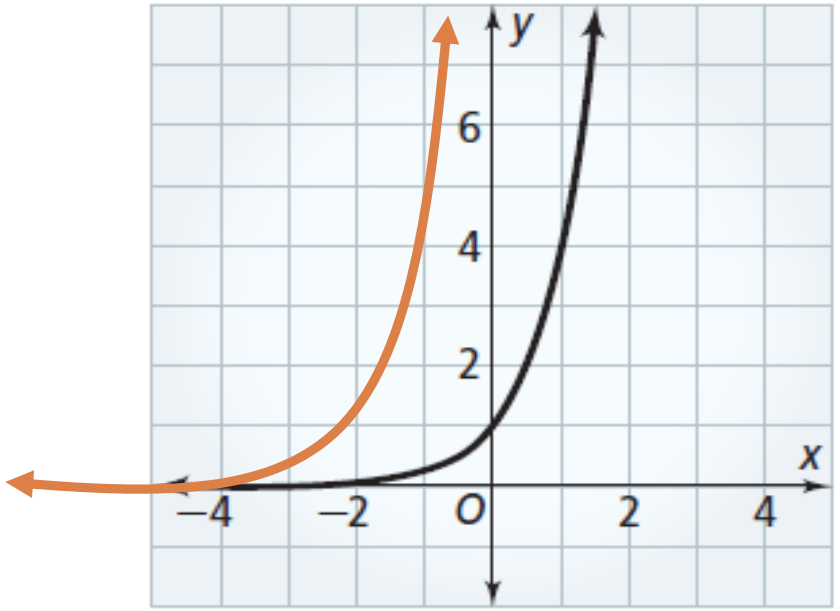
Know that exponential functions and logarithmic functions are inverses of each other

	Exponential	Logarithmic (log)
Parent Function	$y = a * b^{x-h} + k$	$y = alog_b(x - h) + k$
Stretch	|a| > 1	
Shrink/Skew	0 < |a| < 1	
Reflection over x axis	a < 0	
Horizontal Shift	Opposite of h	
Vertical Shift	K	

What transformation?

The graph at the right shows $y = 4^x$. Sketch the graph of $y = 4^{(x+2)}$ on the same set of axes.

Left 2



Logarithmic Functions (Logs)

Remember how I told you that exponentials and logs are inverses?
If exponential is $b^x = y$
Then logarithmic is $b^y = x$

You will often see these written:

$$log_b x = y$$

It just means

$$b^y = x$$

Where b is the base and y is the exponent.

A logarithm **equals** the exponent

Example:

What is the logarithmic form of the equation $6^2 = 36$

$$log_b x = y$$

b is the base: 6 y is the exponent: 2

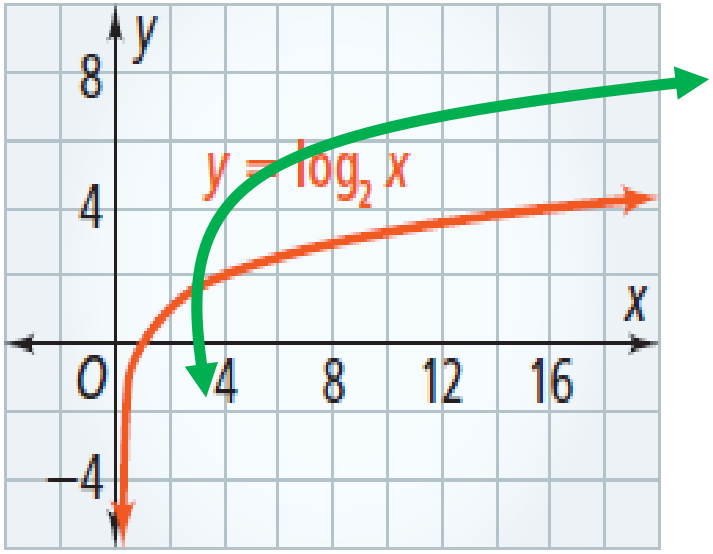
x is what its equal to: 36

$$log_6 36 = 2$$

Example

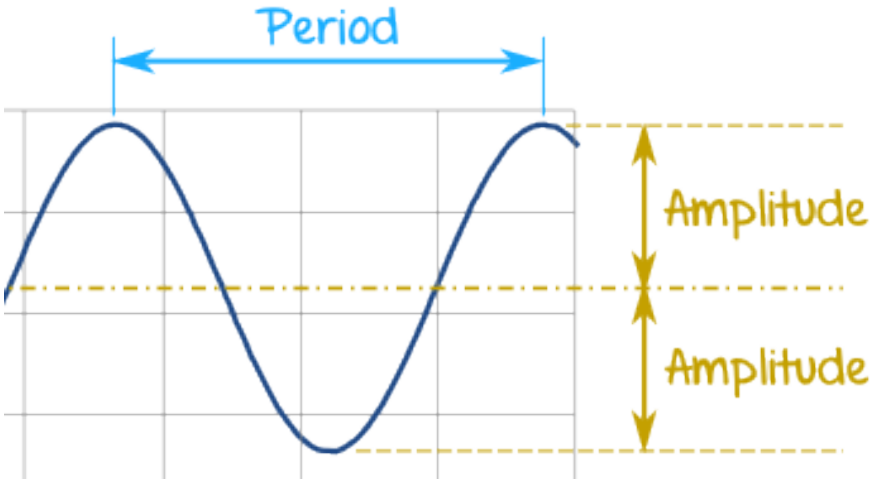
The graph at the right shows the function $y = log_2 x$.
What is the translation from the parent function of $y = log_2(x - 3) + 4$?

Right 3 up 4



Periodic Functions

Periodic functions repeats its y-values at regular intervals.



	Period	**Amplitude**
From a Graph	Distance from 1 crest to the next	½ the distance between the max and min
From an equation	$\frac{2\pi}{\lvert \#next\ to\ x \rvert}$	$\lvert \#out\ front \rvert$

Solving Rational Equations

- Rational equation: $f(x) = \frac{p(x)}{q(x)}$

- Example 1 Solve

$$\frac{5}{x+4} = \frac{1}{x-4}$$

Cross multiply $X+4=5(x-4)$

$x+4=5x-20$

Solve $24=4x$

Check for extraneous solutions $6=x$

Example 2

1. Get common denominator
2. Cross multiply
3. Solve
4. Check for extraneous solutions

$$\frac{8}{x}+\frac{1}{3}=\frac{5}{x}$$

$$\frac{24+x}{3x}=\frac{5}{x}$$

$$15x = x^2 + 24$$

$$x^2 - 15x + 24 = 0$$

Use Quadratic formula/factor/use calculator to solve

x= 14.5 x= 1/2

Example

$$\frac{8}{x}+\frac{1}{3}=\frac{5}{x}$$

$$\left(\frac{3}{3}\right)\frac{8}{x}+\left(\frac{x}{x}\right)\frac{1}{3}=\left(\frac{3}{3}\right)\frac{5}{x}$$

$$\frac{24}{3x}+\frac{x}{3x}=\frac{15}{3x}$$

$$\frac{24+x}{3x}=\frac{15}{3x}$$

$$24+x=15$$

$$x=-9$$

Tricks of the trade…use your calculator!!!!

What are the solutions of the rational equation $\frac{x+2}{1-2x} = 5$

Go to y= screen
Type in left side in y1 and right side of equation in y2
Graph
2nd trace choose intersection
Press enter 3 times