

Non-Polynomial Review

Name _____

Warm Up: Make sure you TRY every problem

1. Simplify $\sqrt{20}$ 2. Solve $3^x = 27$ 3. Find the amplitude of $y = \sin x$ 4. Solve $\frac{x}{5} = \frac{8}{x}$

Guide Notes:

Radical Rules you must know

A $\sqrt[n]{x^m} = \underline{\hspace{2cm}}$ B $\sqrt[n]{ab} = \underline{\hspace{2cm}}$ C $\sqrt[n]{\frac{a}{b}} = \underline{\hspace{2cm}}$ D $\sqrt[2]{x^2} = \underline{\hspace{2cm}}$

Examples:

Simplify

1. $\sqrt[3]{343}$ 2. $\sqrt{7} * \sqrt{28}$ 3. $\sqrt{4a^2b^4c^3}$ 4. Solve: $\sqrt[6]{2^7} = 2^x$

Evaluate

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

Solve:

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

(You should be able to do #1 from warm up)

Exponentials and Logs

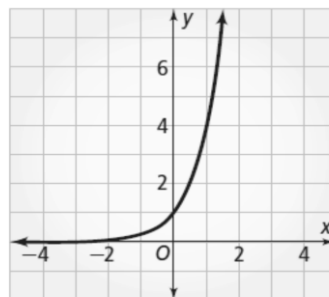
Know that _____ functions and _____ functions are inverses of each other

	Exponential	Logarithmic (log)
Parent Function	$y = a * b^{x-h} + k$	$y = a \log_b(x - h) + k$
Stretch		
Shrink/Skew		
Reflection over x axis		
Horizontal Shift		
Vertical Shift		

Example

The graph at the right shows $y = 4^x$.

Sketch the graph of $y = 4^{x+2}$ on the same set of axes.



Remember how I told you that exponentials and logs are _____?

If exponential is _____

Then logarithmic is _____

You will often see these written: _____

It just means: _____

Where b is the base and y is the exponent.

Examples:

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

$\log_b x = y$

b is the base:

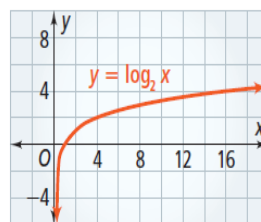
y is the exponent:

x is what its equal to:

The graph at the right shows the function $y = \log_2 x$.

What is the translation from the parent function of

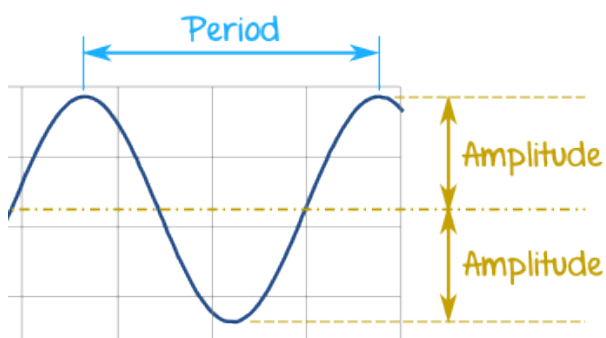
$y = \log_2(x - 3) + 4$?



You should be able to do #2 on the warm up

Periodic Functions

Periodic functions repeats its _____ at regular _____.



You should be able to do #3 on the warm up

Solving Rational Equations: $f(x) = \frac{p(x)}{q(x)}$

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

	Period	Amplitude
From a Graph		
From an equation		

You should be able to do #4 on the warm up

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

Calculator Tricks - Put the function into the y = part on 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

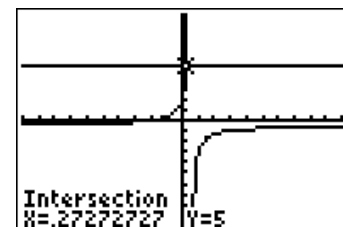
Graph

2nd trace choose intersection

Press enter 3 times

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Plot1 Plot2 Plot3
Y1=(X+2)/(1-2X)
Y2=5
Y3=
Y4=
Y5=
Y6=
Y7=
    
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Practice Problems:

Practice: Solve each. Check for extraneous solutions

1. $\frac{x}{4} = \frac{x+1}{3}$

2. $\frac{3x}{5} + \frac{4}{x} = \frac{4x+1}{5}$

3. $\frac{3x}{x-2} = 4 + \frac{x}{5}$

Rewrite the following in log form.

4. $100 = 10^2$

5. $9^3 = 729$

6. $\left(\frac{1}{2}\right)^4 = \frac{1}{16}$

7. Draw a line from each *logarithm* equation in Column A to its exponential equation in Column B.

Column A

$\log_2 16 = 4$

$\log_3 9 = 2$

$\log_{10} 1000 = 3$

$\log_b x = y$

Column B

$10^3 = 1000$

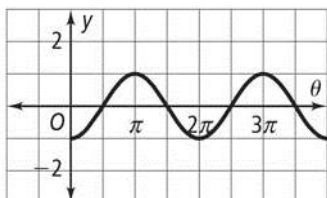
$b^y = x$

$3^2 = 9$

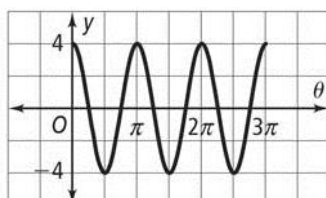
$2^4 = 16$

Determine the period and amplitude of each graph.

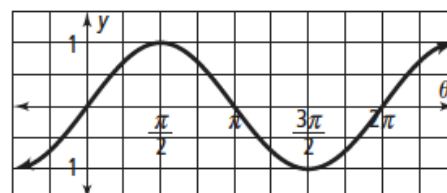
8.



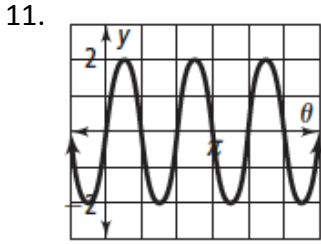
9.



10.



Determine the number of cycles each sine function has in the interval from 0 to 2π . Find the amplitude and period of each function.



12. $y = \sin 2\theta$

Simplify:

13. $\sqrt{36x^4}$

14. $\sqrt{5a^3} * \sqrt{20a}$

15. Scientists use the Beaufort wind scale to approximate wind speed. The formula is $B = 1.69\sqrt{s + 4.45} - 3.49$, where B is the Beaufort number and s is the wind speed in miles per hour. To the nearest mile per hour, what is the approximate wind speed if the Beaufort number is 6?

- A. 2 B. 12 C. 27 D. 253

16. Where do the minimum values of $y = \sin x$ occur on $[-2\pi, 2\pi]$?

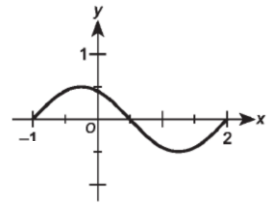
- A. $\frac{-\pi}{2}$ and $\frac{3\pi}{2}$ B. $\frac{-3\pi}{2}$ and $\frac{\pi}{2}$ C. $-\pi$ and π D. -2π and 2π

17. Given $x > 0, y > 0$, which expression is equivalent to $\frac{3\sqrt[3]{27x^5} \sqrt[4]{32y^4}}{\sqrt{8x^8y^6}}$

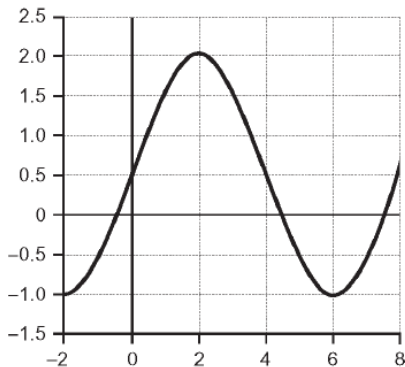
- A. $\frac{3\sqrt[3]{x^2} \sqrt[4]{4}}{2x^3y^2}$ B. $\frac{3\sqrt[3]{2} \sqrt[3]{x^2} \sqrt[4]{2}}{2x^3y^2}$ C. $\frac{3\sqrt[3]{x^2} \sqrt[4]{2}}{\sqrt{2}x^3y^2}$ D. $\frac{18\sqrt[3]{x^2}}{x^3y^2}$

18. Which best describes the range of the relation $y = f(x)$?

- A. $-1 \leq x \leq 2$ B. $-\frac{1}{2} \leq x \leq \frac{1}{2}$ C. $-1 \leq y \leq 2$ D. $-\frac{1}{2} \leq y \leq \frac{1}{2}$



19. The illustration shows part of the graph of $y = \frac{3}{2} \sin\left(\frac{4x}{5}\right) + \frac{1}{2}$ in the xy -plane. What is the period of the function?



- A. 8
B. $\frac{5}{4}\pi + \frac{1}{2}$
C. $\frac{5}{2}\pi$
D. 3π

20. If $\log_2 x = -3$, what is x ?

- A. $\frac{1}{9}$
B. $\frac{1}{8}$
C. 8
D. 9

1. $x = -4$	2. $x = -5$	3. $x = -8$	4. $\log_{10} 100 = 2$	5. $\log_9 729 = 3$	6. $\log_{1/2} 1/16 = 4$	7. $\log_b x = y$	8. amp: 1 period: 2π	9. Amp: 4 period: π	10. Amp: 1 period: 2π	11. Amp: 2 period: π	12. amp: 3 cycles: 312	13. $6x^2$	14. $10a^2$	15. C	16. A	17. C	18. D	19. A	20. B
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