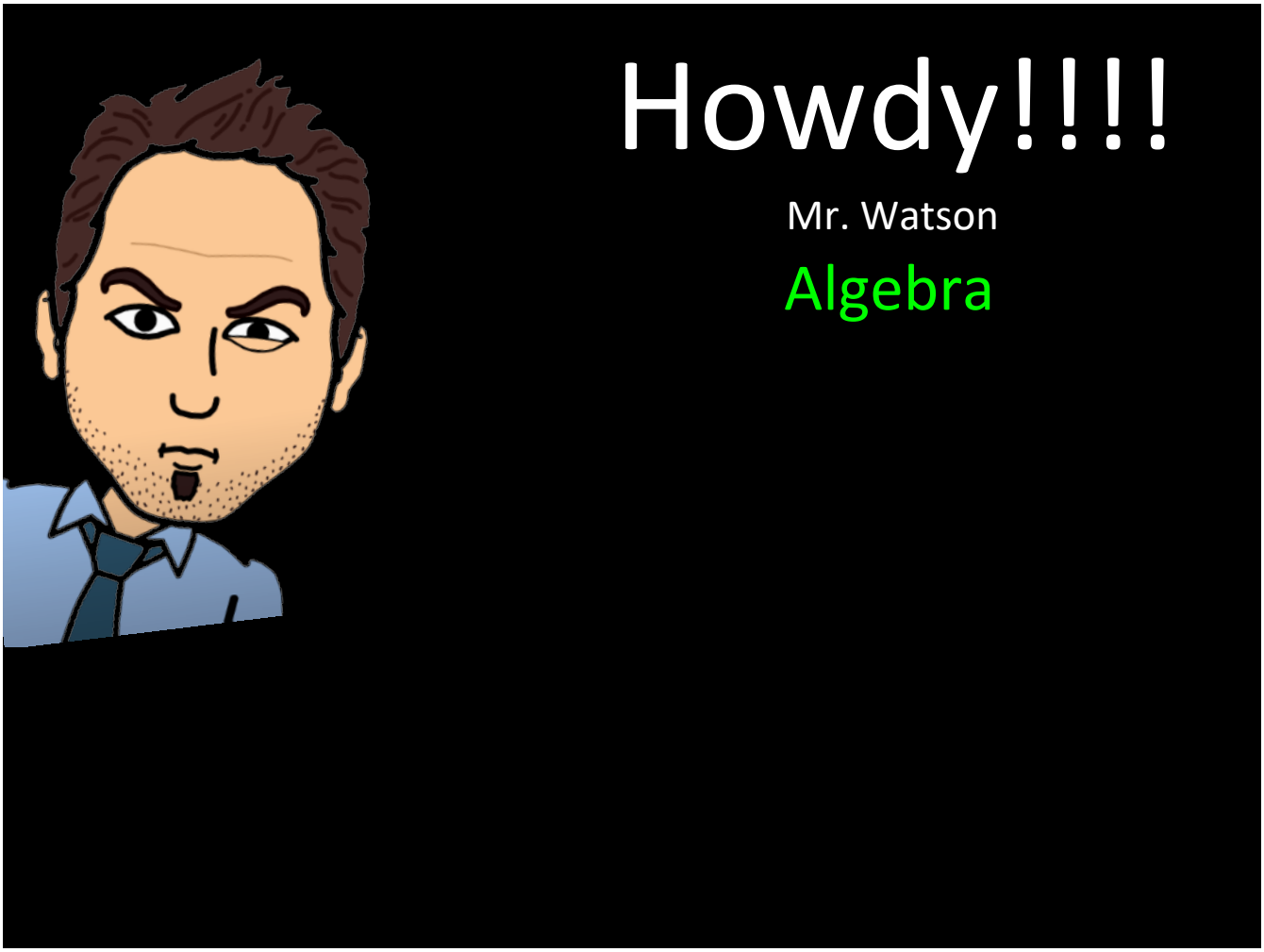
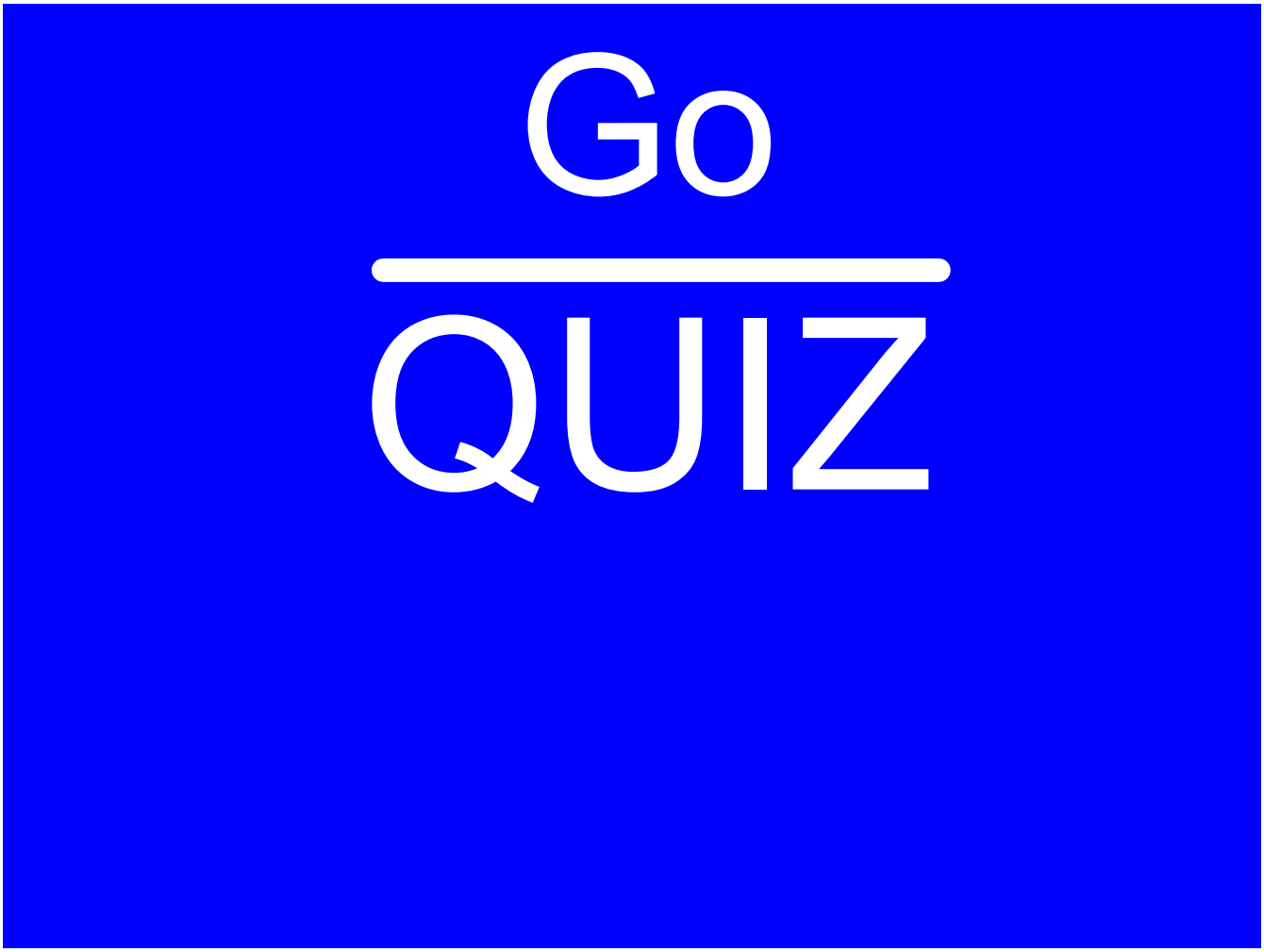

Howdy!!!!
Mr. Watson
Algebra

2nd 6 Weeks

Summative


Go
QUIZ

Solving Exponentials

Power Table

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

	0	1	2	3	4	5	6	7
2^x	1	2	4	8	16	32	64	128
3^x	1	3	9	27	81	243		
4^x	1	4	16	64	256	1024		
5^x	1	5	25	125	625			
6^x	1	6	36	216	1296			
7^x	1	7	49	343				

So what must the value of "x" be in order for this to be true?

$$6^x = 6^3$$

$x = 3$

What about this?

$$6^{x+2} = 6^5$$

$x = 3$

What about this?

$$6^{10} = 6^{2x}$$

$x = 5$

BASIC EXPONENTIALS: ***To work the following, set the exponents equal to each other and solve.***

$7^{3x+8} = 7^{2x-5}$

$3x+8 = 2x-5$

$-2x \quad -2x$

$1x+8 = -5$

$-8 \quad -8$

$x = -13$

$5^{-2x} = 5^{3x-10}$

$-2x = 3x-10$

$-3x \quad -3x$

$\frac{-5x}{-5} = \frac{-10}{-5}$

$x = 2$

A LITTLE LESS BASIC EXPONENTIALS: ***To work these, you will need to rewrite the terms using the same base, then solve.***

$2^{2x} = 8^4$

$2^{2x} = 2^{3(4)}$

$\frac{2x}{2} = \frac{12}{2}$

$x = 6$

$3^{x+3} = 27^2$

$3^{x+3} = 3^{3(2)}$

$x + 3 = 6$

$-3 \quad -3$

$x = 3$

$125^{3x} = 5^{4x+10}$

$5^{3(3x)} = 5^{4x+10}$

$9x = 4x + 10$

$-4x \quad -4x$

$\frac{5x}{5} = \frac{10}{5}$

$x = 2$

NOT SO BASIC EXPONENTIALS: ***Rewrite both sides using the same base, then solve for x.***

$8^{2x} = 16^{3}$

$2^{3(2x)} = 2^{4(3)}$

$\frac{6x}{6} = \frac{12}{6}$

$x = 2$

$25^{x+2} = 625^{2x-10}$

$5^{2(x+2)} = 5^{4(2x-10)}$

$2x + 4 = 8x - 40$

$-2x \quad -2x$

$4 = 6x - 40$

$+40 \quad +40$

$\frac{44}{6} = \frac{6x}{6}$

$x = 7.3$

EXPONENTIAL INEQUALITIES:* ***Remember, when solving inequalities you need to flip the inequality sign when dividing or multiplying by a negative number. You also need to check your solutions to make sure they make sense.***

$3^{12} > 9^{2x}$

$3^{12} > 3^{2(2x)}$

$\frac{12}{4} > \frac{4x}{4}$

$3 > x$

$x < 3$

$27^{x-2} \leq 81^{x+7}$

$3^{3(x-2)} \leq 3^{4(x+7)}$

$3x - 6 \leq 4x + 28$

$-3x \quad\quad -3x$

$-6 \leq 1x + 28$

$-28 \quad\quad -28$

$-34 \leq x$

$x \geq -34$

$16^{-1} < 64^{-x-2}$

$4^{2(-1)} < 4^{3(-x-2)}$

$-2 < -3x - 6$

$+6 \quad\quad +6$

$\frac{4}{-3} < \frac{-3x}{-3}$

$-\frac{4}{3} > x$

$x < -\frac{4}{3}$

$3x - 6 \leq 4x + 28$

$-4x \quad\quad -4x$

$-1x - 6 \leq 28$

$+6 \quad\quad +6$

$\frac{-1x}{-1} \leq \frac{34}{-1}$

$x \geq -34$

Put it all together:

$6^{2a+4} = 6^{2a+9}$	$27^{1-3b} = 9$	$4^{3c} = 1$
		$4^{3c} = 4^{0}$
		$\frac{3c}{3} = \frac{0}{3}$
		$c = 0$

Put it all together:

$4^{3a} = 2^3$	$16^{-2b} = 64^b$	$27^{c-2} < 3^5$

Partner Problems!

CCGPS Coordinate Algebra
Solving Exponential Equations and Inequalities

Name:_____

Date:_____ Block:_____

Solve each of the following equations or inequalities. Answers are at the bottom of this page.

1. $5^{3-2x} = 5^{-x}$

2. $2^{2m+2} < 2^{3m}$

3. $3^{2a} \geq 3^{-a}$

4. $6^{-2p} = 6^{2-3p}$

5. $4^{-x} = 64$

6. $100^{4-x} > 10^{x-1}$

7. $3^{m+1} \leq 9^{m-2}$

8. $5^{5x} = 125^{x+2}$

9. $9^{2x-5} = 27$

10. $4^{3x-6} = 8^{x+3}$

FOLD ALONG THIS LINE TO HIDE YOUR ANSWERS UNTIL YOU'RE READY TO CHECK THEM

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1. x=3
2. 2<m
3. $a \geq 0$
4. p=2
5. x=-3
6. 3>x
7. $5 \leq m$
8. x=3
9. $x=\frac{13}{4}$
10. x=7

HOMEWORK!!!

Kuta Software - Infinite Algebra 2 Name_____

Exponential Equations Not Requiring Logarithms

Date_____ Period____

Solve each equation.

1) $4^{2x+3} = 1$

2) $5^{3-2x} = 5^{-x}$

3) $3^{1-2x} = 243$

4) $3^{2a} = 3^{-a}$

5) $4^{3x-2} = 1$

6) $4^{2p} = 4^{-2p-1}$

7) $6^{-2a} = 6^{2-3a}$

8) $2^{2x+2} = 2^{3x}$

[redacted]

[redacted]

2^x

[redacted]

[redacted]

10