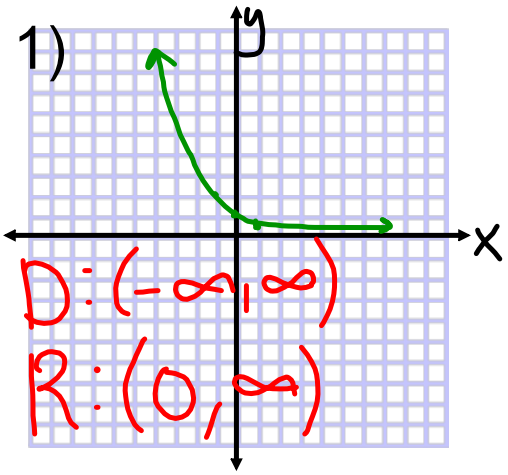
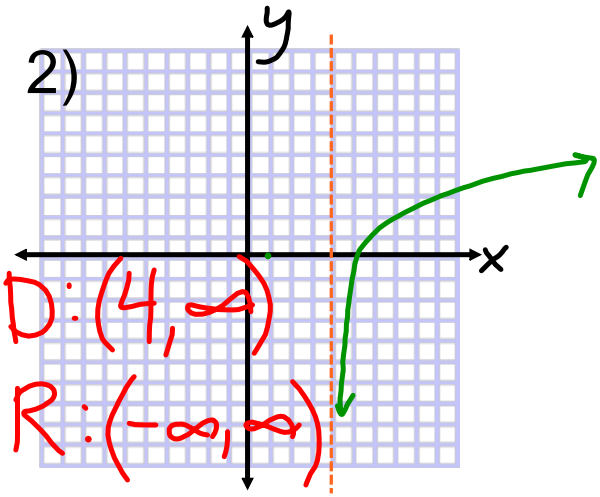
Using the graph, state the domain and range in interval notation.

1)

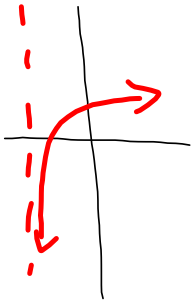


2)



Using a sketch or your previous knowledge, state the domain and range in interval notation.

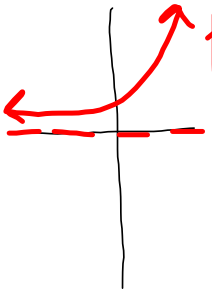
3) $y = \log(x+4)$



D: $(-4, \infty)$

R: $(-\infty, \infty)$

4) $y = 3(2)^x$



D: $(-\infty, \infty)$

R: $(0, \infty)$

8.5 Exponents and Log Equations

Solve each log equation for x.

→ convert to exponential form

$\log_{10}(2x+5)=2$

$10^2=2x+5$

$100=2x+5$

47.5

$\log_3(5x-4)-6=-8$

$+6 \quad +6$

$\log_3(5x-4)=-2$

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

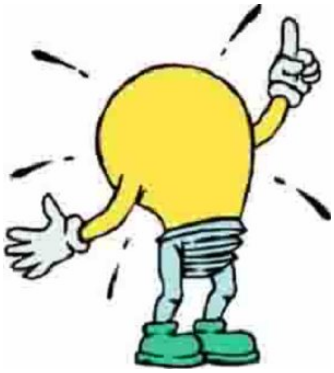
$\frac{1}{9}=5x-4$

$x=\frac{37}{45}$

8.5 Exponents and Log Equations

How can we solve exponential equations when the bases are not the same?

For example:



$27^{2x} = 3^{5x+8}$

$3^{3(2x)} = 3^{5x+8}$

$6x = 5x + 8$

$-5x \quad -5x$

$x = 8$

?

Solve $7^{3x} = 20$

1. Take the log of each side. Pull

$\log 7^{3x} = \log 20$

2. Use property of logs. Pull

$\frac{3x \cdot \log 7}{\log 7} = \frac{\log 20}{\log 7}$ Solve for x.

3. Use a calculator. Pull

$7^{3x} = 20$ $3x = 1.539$

4. $x = .51$

5. Ck answer with calculator.

Watch video

Solve $12^{3x+1} = 20$

1 Take the log of each side. Pull

$\log 12^{3x+1} = \log 20$

Use property of logs. Pull

2 $\frac{(3x+1)\cdot \log 12}{\log 12} = \frac{\log 20}{\log 12}$

3 Pull

$3x+1 = 1.2$

$-1 \quad -1$

4 Pull

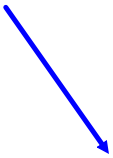
$x = .07$

5 Pull

Pull

Watch video

The log on your calculator only has a base of 10. We can change the base by using



Property **Change of Base Formula**

For any positive numbers, M, b, and c, with $b \neq 1$

$$\log_b M = \frac{\log M}{\log b}$$

Use the change of base formula to evaluate.

$\log_3 83$ Pull $\frac{\log 83}{\log 3} = 4.02$

Pull

How do you solve these problems?

$$5^{2x-3}+7=18$$

$$2-14^{3x}=-130$$

$-2 \quad -2$

$$-14^{3x}=-132$$

$\frac{-14^{3x}}{-1}=\frac{-132}{-1}$

$$14^{3x}=132$$

$3x \log 14 = \log 132$

$$3x=\frac{\log 132}{\log 14}$$

$x = .62$

HOMEWORK 8.5

just evaluate!
don't change to base 8

P. 464 #1-15 ODD, 25-41 ODD,
53-59 ODD (NO CALC)
#80,81

8.5 Part 2

WARM UP

State the domain and range in interval notation.

1) $y = \log_4(x+3)$

2) $y = 3\left(\frac{1}{2}\right)^x - 5$

Solve for x.

3) $5^x + 7 = 18$

4) $27^x = 81$

5) $\log_{10}(8-2x) = 3$

Sort each problem into the correct category, then solve each problem.

take log of each side	get the same base	rewrite as exponential eq (the loop)
$\log_8(2x-1)=\frac{1}{3}$	$\log(3x-8)=2$	$4^{3x}=\left(\frac{1}{16}\right)^8$
$3^{7x+1}=121$	$8^x=40$	$2^{3x}=8$

HW8.5 Day 2

p. 465 #54-60 even (NO CALC)
and 85-96 all (skip 92)
and
p. 468 Ckpoint Quiz #1-9 all

Attachments

jnvu6kq1.bmp