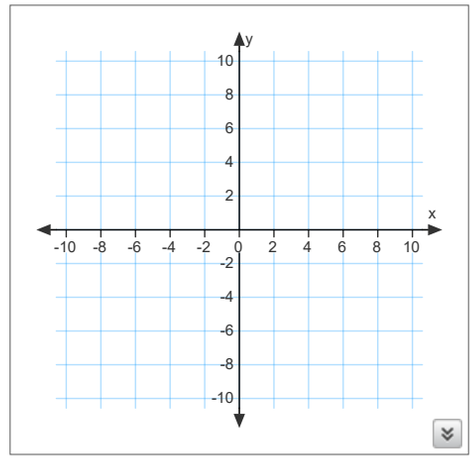
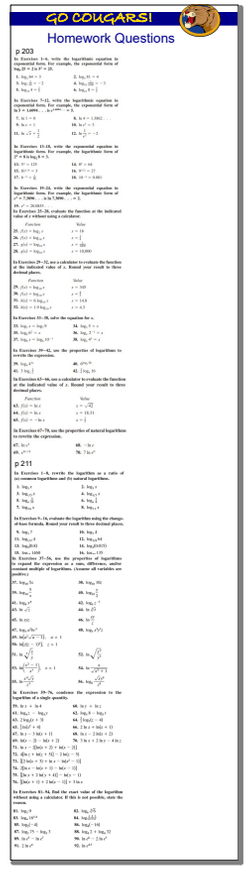
Warm up

1. Rewrite.
   a. $x^4 = 3$
   b. $e^5 = x$
   c. $\log_3 x = 7$
   d. $\ln x = r$
2. Evaluate
   a. $\log_4 \frac{1}{16} - \log_3 81$
   b. $4 \ln e^6$
3. Solve
   $x^4 - 4x^2 - 12 = 0$
3. Sketch by hand.
   a. $f(x) = e^{x-1} + 3$
   b. $f(x) = \log(-x) - 4$



Nov 7-6:46 AM



Feb 2-9:51 PM

3.4 Solving Equations Day 1

Matching bases

Exponential

Oct 25-12:08 PM

Solve

$5^x = 125$

$5^x = 5^3$

$x = 3$

$\left(\frac{1}{2}\right)^x = 8$

$(2^{-1})^x = 8$

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

$-x = 3$

$x = -3$

$9^{x+1} = 27$

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

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

$2x+2 = 3$

$2x = 1$

$x = \frac{1}{2}$

Oct 25-12:09 PM

To solve other Exponential Equations

change exp ⟶ log

$5[3^x] = 35$

$\frac{5}{5} \quad \frac{35}{5}$

$3^x = 7$

$\log_3 7 = x$

$\frac{\log 7}{\log 3}$

1.77

1. Isolate the term with the variable
2. Rewrite as a log problem to 'untrap' the x
3. Simplify using change of base

$\log 3^x = \log 7$

$x\log 3 = \log 7$

$\frac{x\log 3}{\log 3} = \frac{\log 7}{\log 3}$

$x = \frac{\log 7}{\log 3}$

$= 1.77$

$3^x = 7$

$\log_3 3^x = \log_3 7$

$x = \log_3 7$

$x = \frac{\log 7}{\log 3}$

Oct 25-12:10 PM

$4 + 2[e^{3x}] = 9$

$-4 \quad -4$

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

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

$\frac{\ln_e \frac{5}{2}}{3} = \frac{3x}{3}$

$.305 = x$

OR

$\ln e^{3x} = \ln \frac{5}{2}$

$\frac{3x}{3} = \frac{\ln \frac{5}{2}}{3}$

$6(2^{4x-1}) - 5 = 19$

$\frac{6(2^{4x-1})}{6} = \frac{24}{6}$

$2^{4x-1} = 4$

$\frac{}{2} \quad \frac{}{2}$

$2^{4x-1} = 2^2$

$4x - 1 = 2$

$x = \frac{3}{4}$

can't divide by the base

Oct 25-12:13 PM

$e^{2x} - 4e^{x} + 3 = 0$

quadratic!

$(e^x)^2 - 4e^x + 3 = 0$

$3, -4 \Rightarrow -3, -1$

$(e^x - 3)(e^x - 1) = 0$

$e^x = 3 \mid e^x = 1$

$\ln_e 3 = x \quad \ln 1 = x$

$1.1 = x \quad 0 = x$

$3^x = 4^{x-1}$

$\log 3^x = \log 4^{x-1}$

$x \log 3 = (x-1)\log 4$

$x \log 3 = x \log 4 - \log 4$

$x \log 3 - x \log 4 = -\log 4$

$x(\log 3 - \log 4) = -\log 4$

$x = \frac{-\log 4}{\log 3 - \log 4}$

$x = 4.82$

Oct 25-12:16 PM

HOMEWORK

p 221 3, 11, 21-27 odd, 47-51 odd,

57-67 odd

p 206 113-123 odd

Aug 29-6:38 AM