

## Warm up

1. Rewrite.

a.  $x^4 = 3$   $\log_x 3 = 4$

b.  $e^5 = x$   $\ln x = 5$

c.  $\log_3 x = 7$   $3^7 = x$

d.  $\ln x = r$   $e^r = x$

2. Evaluate

a.  $\log_4 \frac{1}{16} - \log_3 81$

b.  $4 \ln e^6$   $-2 - 4 = -6$

3. Solve

$$x^4 - 4x^2 - 12 = 0$$

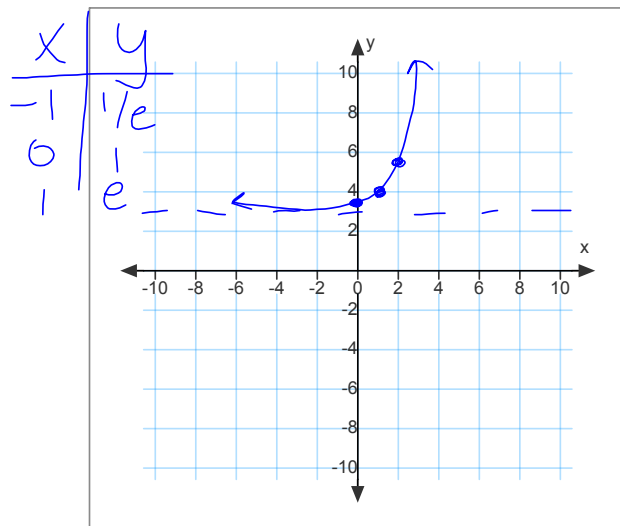
$$(x^2 - 6)(x^2 + 2)$$

$$x = \pm\sqrt{6} \quad x = \pm\sqrt{2}i$$

3. Sketch by hand.

a.  $f(x) = e^{x-1} + 3$

b.  $f(x) = \log(-x) - 4$



GO COUGARS!



## Homework Questions

$$\ln x - 2 [\ln(x+2) + \ln(x-2)]$$

$$\ln(x+2)(x-2)$$

$$\ln x - 2 \ln(x^2-4)$$

$$\ln x - \ln(x^2-4)^2$$

$$\ln \frac{x}{(x^2-4)^2}$$

## 3.4 Solving Equations Day 1

Matching bases

Exponential

Solve

$$5^x = 125$$

$$5^x = 5^3$$

$$\boxed{x=3}$$

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

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

$$-x = 3$$

$$\boxed{x=-3}$$

$$9^{x+1} = 27$$

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

$$2x+2 = 3$$

$$2x = 1$$

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

To solve other Exponential Equations

change exp  $\longrightarrow$  log

$$5(3^x) = 35$$

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

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

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

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

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

$$x = .305$$

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

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

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

$$\log_2 4 = 4x - 1$$

$$2 = 4x - 1$$

$$3 = 4x$$

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

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

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

$$x^2 - 4x + 3$$

$$(x-3)(x-1)$$

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

$$\downarrow$$

$$\downarrow$$

$$e^x = 3$$

$$e^x - 1 = 0$$

$$\ln 3 = x$$

$$e^x = 1$$

$$x = 0$$

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

$$\log_3 4^{x-1} = x$$

$$(x-1)\log_3 4 = x$$

$$1.262(x-1) = x$$

$$1.262x - 1.262 = x$$

$$\frac{.262x}{.262} = \frac{1.262}{.262}$$

$$x = 4.817$$

$$x = 4.817$$

# HOMEWORK



p 221 3, 11, 21-27 odd, 47-51 odd,  
57-67 odd

p 206 113-123 odd

**Cardassian Project Due Monday**

If you are sending me an electronic version, it is due by the beginning of your period.