Today's Plan:

Learning Target (standard): I will solve logarithmic and exponential equations.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, and take a quiz.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide quiz problems.

Assessment: Board work, homework check and quiz

Differentiation: Students will work at the board, go over and correct homework at their seats, and actively engage in quiz problems.

Logarithmic & Exponential Equations Practice:

1) $x = -\frac{5}{128}$

2) $x = \frac{1}{1-e}$ (no solution)

3) $x = \frac{128}{121}$

4) $x = -\frac{27}{10}$

5) $x = -\frac{5}{162}$

6) $x = -\frac{25}{4}$

7) $x = 2$

8) $x = -\frac{49}{4}, \frac{49}{4}$

9) $x = 1$

10) $n = 0$

11) $m = -\frac{1}{6}$

12) $x = -8$

13) $n = -6, 4$

14) $r = -3, 3$

15) $n = 0$

16) $-6 \neq 0$ (no solution)

17) $a = -1$

18) $x = -\frac{1}{3}$

19) $n = \frac{6\ln 10 + \ln 37}{\ln 10}$

20) $k = \frac{\ln 79 + \ln 7 - \ln 4}{\ln 7}$

* QUIZ today! *

Solve:

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

$e^{-x^2} = e^{2x} \cdot e^{-3}$

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

$-x^2 = 2x-3$

$0 = x^2+2x-3$

$0 = (x+3)(x-1)$

$x = -3, 1$

Solve:

$$\log_9 x + 3\log_3 x = 14$$

$\frac{\log_3 x}{\log_3 9} + 3\log_3 x = 14$

$\frac{\log_3 x}{2} + 3\log_3 x = 14$

$\frac{1}{2}\log_3 x + 3\log_3 x = 14$

$\frac{7}{2}\log_3 x = 14$

$\log_3 x = 4$

$3^4 = x$

$x = 81$

$\log_3 x^{\frac{1}{2}} + \log_3 x^3 = 14$

$\log_3 x^{\frac{1}{2}}(x^3) = 14$

$\log_3 x^{\frac{7}{2}} = 14$

$\left(3^{14}\right)^{\frac{2}{7}} = \left(x^{\frac{7}{2}}\right)^{\frac{2}{7}}$

$3^4 = x$

Solve:

$$\log_2\left(x^2+1\right)-\log_4 x^2=1$$

$$\log_2(x^2+1)-\frac{\log_2 x^2}{\log_2 4}=1$$

$$\log_2(x^2+1)-\frac{\log_2 x^2}{2}=1$$

$$\log_2(x^2+1)-\tfrac{1}{2}\log_2 x^2=1$$

$$\log_2(x^2+1)-\log_2(x^2)^{\frac{1}{2}}=1$$

$$\log_2(x^2+1)-\log_2 x=1$$

$$\log_2\left(\frac{x^2+1}{x}\right)=1$$

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

$$2x=x^2+1$$

$$0=x^2-2x+1$$

$$0=(x-1)^2$$

$$x=1$$