REVIEW :

1) SAME BASE PROPERTY:

$$\text{IF} \quad a^x = a^y \quad , \text{THEN} \quad x = y$$

EX. $2^x = \cancel{32} \; 2^5$ $\boxed{x = 5}$

$\underbrace{\qquad\qquad}$
SAME
BASE

2) CHANGE OF BASE FORMULA :

$$\log_a x = \frac{\log x}{\log a}$$

EXAMPLE : $\ln 2^{\cancel{x}} = \ln 7 \implies 2^x \, 7$

$\log_2 7 = x$

$$x \cancel{\ln 2} = \frac{\ln 7}{\ln 2}$$

$$\boxed{x = \frac{\ln 7}{\ln 2}}$$

$$\frac{\log 7}{\log 2} = x$$

$$\boxed{x \approx 2.80735}$$

1) STEPS FOR SOLVING EPONENTIAL EQUATIONS.

A) ISOLATE THE EXPONENTIAL EXPRESSION MEANING a^x ON ONE SIDE OF EQUATION.

B) CONVERT TO LOGARITHM & USE CHANGE OF BASE FORMULA

OR

"ln" BOTH SIDES TO BRING THE EXPONENT "DOWN" $\longrightarrow x \cdot \ln a = \ln b$

C) THEN SOLVE FOR x.

D) CHECK SOLUTION

EXAMPLE:

$$\frac{\cancel{8}}{\cancel{8}} e^{2x} = \frac{20 \div 4}{8 \div 4}$$

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

$$\frac{\cancel{2}}{\cancel{2}} x = \frac{\ln \frac{5}{2}}{2} \qquad x = \frac{\ln \frac{5}{2}}{2}$$

EXAMPLE $\quad e^{2x} - e^x - 6 = 0 \quad\quad\quad$ LET $u = e^x$

$$u^2 - u - 6 = 0$$

$$(u - 3)(u + 2) = 0$$

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

$$e^x \cancel{-3} = 0 \qquad\qquad e^x \cancel{+2} = 0$$
$$ +3 \; +3 \qquad\qquad -2 \; -2$$

$$\cancel{\ln} e^x = \ln 3 \qquad\qquad \cancel{\ln} e^x = \ln 2$$

$$\boxed{x = \ln 3} \qquad\qquad x = \cancel{\ln (-2)}$$