EXPONENTIAL EQUATIONS

1. GET THE PART WITH VARIABLE IN EXPONENT BY ITSELF
2. TAKE LN OF BOTH SIDES
3. USE PROP. OF LOGS TO GET VARIABLE OUT OF EXPONENT
4. SOLVE FOR X

13. $e^{\ln x^2} - 6x = -8$

$x^2 - 6x = -8$

$x^2 - 6x + 8 = 0$

$(x-2)(x-4) = 0$ (PSD)

$x-2=0 \quad x-4=0$

$\boxed{x=2 \quad x=4}$

14. $200e^{-x+3} = 800$

$\frac{200e^{-x+3}}{200} = \frac{800}{200}$

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

$\ln e^{-x+3} = \ln 4$

$-x+3 = \ln 4$

$\boxed{3 - \ln 4 = x}$

LOG EQUATION

1. GET EVERYTHING WITH A LOG ON ONE SIDE, EVERYTHING ELSE ON OTHER SIDE
2. USE PROP. OF LOGS TO GET A SINGLE LOG
3. USE DEF OF LOG TO REWRITE IN EXP. FORM
4. SOLVE FOR X
5. SEMI-CHECK ANSWERS

15. $5 + 2\ln x = 9$

$2\ln x = 9 - 5$

$2\ln x = 4$

$\frac{2\ln x}{2} = \frac{4}{2}$

$\ln x = 2$

$\boxed{e^2 = x}$

16. $5\ln x = 15$

$\frac{5\ln x}{5} = \frac{15}{5}$

$\ln x = 3$

$\boxed{e^3 = x}$

17. $\ln x + \ln(x+4) = 0$

$\ln x(x+4) = 0$

$e^0 = x(x+4)$

$1 = x^2 + 4x$

$0 = x^2 + 4x - 1$

$a=1 \quad b=4 \quad c=-1$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-4 \pm \sqrt{4^2 - 4(1)(-1)}}{2(1)}$

$= \frac{-4 \pm \sqrt{16+4}}{2}$

$= \frac{-4 \pm \sqrt{20}}{2}$

$= \frac{-4 \pm \sqrt{2 \cdot 2 \cdot 5}}{2}$

$= \frac{-4 \pm 2\sqrt{5}}{2}$

$\frac{-2 \pm 1\sqrt{5}}{1}$

$-2 \pm \sqrt{5}$

$\boxed{-2 + \sqrt{5}}$