Logarithmic Equations - Guided Lesson Explanation

While solving these questions you should keep the following properties in mind:

$\log_b m.n = \log_b m + \log_b n$ $\ln ab = \ln a + \ln b$

$\log_b m/n = \log_b m - \log_b n$ $\ln a/b = \ln a - \ln b$

$\log_b m^r$

$= r\log_b m$ $\ln a^b$

$= b\ln a$

Explanation#1

Isolate the logarithmic expression first

   $14 + 6\ln x = 20$

   $6\ln x = 20 - 14$

   $6\ln x = 6$

   $\ln x = \dfrac{6}{6}$

   $\ln x = 1$

Remember that e^x

 and $\ln x$ are inverse functions.

   $e^{\ln x}$

$= e^3$

 Hence,

$x = e^3$

   $(e^{\ln x}$

$= x)$

So the answer is $x = e^3$

Explanation#2

Isolate the logarithmic expression first

$12+4\ln x=4$

$4\ln x = 4 - 12$

$4\ln x = -8$

$\ln x = \dfrac{-8}{4}$

$\ln x = -2$

Remember that e^x and ln x are inverse functions.

$e^{\ln x}=e^{-2}$;$x=e^{-2}$ ($e^{\ln x}=x$)

So the answer is $x=e^{-2}$

Explanation#3

Isolate the logarithmic expression first

$3+2\ln x=13$

$2\ln x = 13 - 3$

$2\ln x = 10$

$\ln x = \dfrac{10}{2}$

$\ln x = 5$

Remember that e^x and ln x are inverse functions.

$e^{\ln x}=e^{5}$;$x=e^{5}$ ($e^{\ln x}=x$)

So the answer is $x=e^{5}$