

$$①. \ln(x-4) + 17 = 20$$

ISOLATE THE LOG:

$$\ln(x-4) + 17 = 20$$

$$\underline{-17 \quad -17}$$

$$\Rightarrow \ln(x-4) = 3$$

EXPONENTIATE BOTH SIDES

$$\Rightarrow e^{\ln(x-4)} = e^3$$

Simplify using the property

$$e^{\ln(u)} = u$$

$$\Rightarrow x-4 = 20.09$$

$$\underline{+4 \quad +4}$$

$$\Rightarrow \boxed{x = 24.09}$$

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$$②. \ln(6.9x + 2.7) + 29.33 = 30.81$$

$$\underline{-29.33 \quad -29.33}$$

$$\Rightarrow \ln(6.9x + 2.7) = 1.48$$

$$\Rightarrow e^{\ln(6.9x + 2.7)} = e^{1.48}$$

$$\Rightarrow 6.9x + 2.7 = 4.39$$

$$\underline{-2.7 \quad -2.7}$$

$$\Rightarrow 6.9x = 1.69$$

$$\Rightarrow x = \frac{1.69}{6.9}$$

$$\Rightarrow \boxed{x = 0.24}$$

$$\textcircled{3}. \ln(2x-5) - \ln(x+6) = 0$$

$\Rightarrow$ Combine into a single log

$$\Rightarrow \ln\left(\frac{2x-5}{x+6}\right) = 0$$

$$\Rightarrow e^{\ln\left(\frac{2x-5}{x+6}\right)} = e^0$$

$$\Rightarrow \frac{2x-5}{x+6} = e^0$$

$$\Rightarrow \frac{2x-5}{x+6} = 1$$

$$\Rightarrow \frac{2x-5}{x+6} = \frac{1}{1}$$

$$\Rightarrow \begin{array}{r} 2x-5 = x+6 \\ -x \quad -x \hline \end{array}$$

$$\Rightarrow \begin{array}{r} x-5 = 6 \\ +5 \quad +5 \hline \end{array}$$

$$\Rightarrow \boxed{x = 11}$$

$\textcircled{4}$

$$\ln(14.2x) - \ln(x+5.9) = 0$$

$$\Rightarrow \ln\left(\frac{14.2x}{x+5.9}\right) = 0$$

$$\Rightarrow e^{\ln\left(\frac{14.2x}{x+5.9}\right)} = e^0$$

$$\Rightarrow \frac{14.2x}{x+5.9} = 1$$

$$\Rightarrow \begin{array}{r} 14.2x = x+5.9 \\ -x \quad -x \hline \end{array}$$

$$\Rightarrow 13.2x = 5.9$$

$$\Rightarrow \boxed{x = \frac{5.9}{13.2}}$$

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$$\textcircled{5}. \ln(6x+4) - 22.63 = -19.4$$

$+22.63 \quad +22.63$

$$\Rightarrow \ln(6x+4) = 3.23$$

$$\Rightarrow e^{\ln(6x+4)} = e^{3.23}$$

$$\Rightarrow 6x+4 = e^{3.23}$$

$$\Rightarrow \begin{array}{r} 6x+4 = 25.28 \\ -4 \quad -4 \hline \end{array}$$

$$\Rightarrow 6x = 21.28$$

$$\Rightarrow x = \frac{21.28}{6}$$

$$\Rightarrow \boxed{x = 3.55}$$