1 *Solve the equation*
$$2^{-x} = 16.$$

(Show at least one intermediate step.)

I want to make 16 an exponential expression with base 2; since $16 = 2 \cdot 2 \cdot 2 \cdot 2$, I can do this:

$$2^{-x} = 16;$$
$$2^{-x} = 2^4;$$
$$-x = 4;$$
$$x = -4.$$

2 *Evaluate* $\log_{1/2} 16$. *(Show at least one intermediate step not using a calculator.)*

This logarithm is the unique solution x to the equation $(1/2)^x = 16$. Like Problem 1, I solve this by getting everything with base 2:

$$\left(\frac{1}{2}\right)^x = 16;$$
$$\frac{1}{2^x} = 2^4;$$
$$2^{-x} = 2^4;$$
$$-x = 4;$$
$$x = -4.$$

Therefore,
$$\log_{1/2} 16 = 4.$$

3 *Find the domain of the function f given by*
$$f(x) = \ln(x + 4).$$

(Show at least one intermediate step.)

I can only take the logarithm of a positive number:

$$x + 4 > 0;$$
$$x > -4.$$

Therefore,
$$\operatorname{dom} f = \{x \mid x > -4\}.$$