

1. (8 points) Solve this equation for x :

$$2(10^{x-5}) = 44$$

$$10^{x-5} = 22$$

$$x-5 = \log_{10} 22$$

$$x = \log_{10} 22 + 5$$

2. (8 points) Solve this equation for x :

$$\log_3 x + \log_3(x+8) = 2$$

$$\log_3 x(x+8) = 2$$

$$3^2 = x^2 + 8x$$

$$0 = x^2 + 8x - 9$$

$$= (x+9)(x-1)$$

~~$x = -9$~~ $x = -9$ ← not in domain

$x = -9$	$x = 1$
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3. (8 points) Suppose a sequence is generated by the function $a_n = \frac{(-2)^n}{n+2}$

(a) What is the domain of the function in this situation?

\mathbb{N}

(b) What are the first three terms of the sequence and the 20th term of the sequence?

$$a_1 = \frac{-2}{3}$$

$$a_2 = \frac{4}{4} = 1$$

$$a_3 = \frac{-8}{5}$$

$$a_{20} = \frac{(-2)^{20}}{22}$$

4. (10 points) Consider the function $g(x) = \ln(x + 3)$.

(a) State the domain of $g(x)$.

$$x + 3 > 0 \quad x > -3$$
$$(-3, \infty)$$

(b) Use transformations to sketch the graph of $g(x)$. State what transformations you applied, clearly label any asymptotes, and clearly label at least one point on the graph.

