Name: _____

Write all of your responses on these exam pages. If you need extra space please use the backs of the pages. Show all your work, answers without supporting justification will not receive credit. Keep your answers in exact form. **No calculation devices allowed.**

1. (*15 Points*) Find the exact value of the following.

   (a) $e^{\ln(5)+\ln(2)}$

   (b) $\log_3(9)$

   (c) $\log(1,000,000,000)$

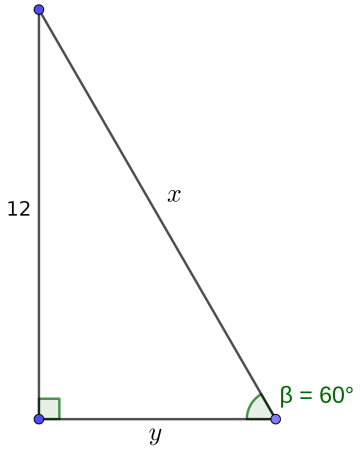
2. (*15 Points*) Solve the equation.

$$e^x + 1 = 12e^{-x}$$

3. (*15 Points*) Solve the equation.

$$\log_4(x+1) = 2 + \log_4(3x-2)$$

4. (*15 Points*) Find the exact values of x and y.



5. (*15 Points*) Verify the identity by transforming the left-hand side into the right-hand side.

$$\frac{\tan(-\theta) + \cot(-\theta)}{\tan(\theta)} = -\csc^2(\theta)$$

6. (*15 Points*) Find the exact values of the remaining trigonometric functions if $\sec(\theta) = \sqrt{13}/2$ and $\tan(\theta) = -3/2$.

7. (*15 Points*) Find the amplitude, period, and phase shift and sketch the graph of

$$y = 3\sin\left(2x - \frac{\pi}{4}\right)$$