Math 32 Quiz

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Name: _____ Score: /10

You have twenty minutes to complete this quiz. You may not use calculators or notes, but the chalkboards are yours.

1. (2 pts) Simplify the expression:

$$\left(2^{3+\sqrt{3}}2^{3-\sqrt{3}}\right)^{1/2}$$

$$\begin{aligned}\left(2^{3+\sqrt{3}}2^{3-\sqrt{3}}\right)^{1/2} &= \left(2^{(3+\sqrt{3})+(3-\sqrt{3})}\right)^{1/2}\\ &= \left(2^6\right)^{1/2}\\ &= 2^{6(1/2)}\\ &= 2^3 = \boxed{8}\end{aligned}$$

2. (3 pts) Simplify the expression:

$$\ln e + \ln\sqrt{e} + \ln 1 + \ln(e^{\ln 10})$$

$$\begin{aligned}\ln e + \ln\sqrt{e} + \ln 1 + \ln(e^{\ln 10}) &= 1 + \frac{1}{2}\ln e + 0 + \ln 10\\ &= 1 + \frac{1}{2} + \ln 10 = \boxed{\frac{3}{2} + \ln 10}\end{aligned}$$

3. (2 pts) Which is larger, $\log_3 30$ or $\log_5 120$? Why?

   $\log_3 30$ *is bigger than but roughly* $\log_3 27 = 3$*, whereas* $\log_5 120 \lesssim \log_5 125 = 3$*. Hence* $\boxed{\log_3 30}$ *is larger.*

4. (3 pts) Graph the function $y = \log_2(4-x)$. Be sure to find the values of all horizontal and vertical intercepts and asymptotes.