

EE322 Fall 2007: Quiz 1 Basic Math (Take Home Quiz)
No Calculators! Work Independently!

1. Simplify: $e^5 \cdot e^{-2} =$ _____
2. Simplify: $\frac{10^5}{2 \times 10^2} =$ _____
3. Simplify: $\int (x+1) dx =$ _____
4. Simplify: $\int 2e^{-2x} dx =$ _____
5. Solve: $\int_0^1 t dt =$ _____
6. Solve: $\int_0^3 4e^{2t} dt =$ _____
7. Solve: $\int_{-1}^1 \cos 2\pi t dt =$ _____
8. Solve: $\int_{-1}^1 (2t + t^2) dt =$ _____
9. Simplify: $\frac{d}{dt} 4e^{5t} =$ _____
10. Simplify: $\frac{d}{dt} \sin 2\pi 20t =$ _____
11. Simplify: $\frac{d}{dt} (3t + 10t^5) =$ _____
12. Find the magnitude: $\left| \frac{3 + j4}{-3 - j4} \right| =$ _____
13. Find the phase of $1 - j1$: _____

14. Simplify: $10 \log_{10} 100 = \underline{\hspace{2cm}}$

15. Simplify: $10 \log_{10} 0.01 = \underline{\hspace{2cm}}$

16. Simplify: $10 \log_{10} 10^6 = \underline{\hspace{2cm}}$

17. Simplify: $10 \log_{10} \left(\frac{2000}{0.2} \right) = \underline{\hspace{2cm}}$

18. Simplify: $10 \log 50 - 10 \log 5 = \underline{\hspace{2cm}}$

19. Simplify: $10 \log 50 + 10 \log 20 = \underline{\hspace{2cm}}$

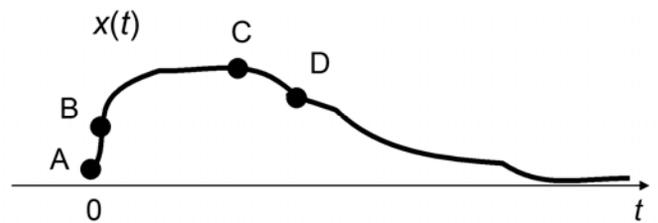
20. A cosine signal that has a frequency of 100 Hz has a period of $\underline{\hspace{2cm}}$?

21. The integral of a cosine signal over one period is $\underline{\hspace{2cm}}$?

22. Sketch a plot of voltage signal e^{-t} for $t \geq 0$. Label the axes.

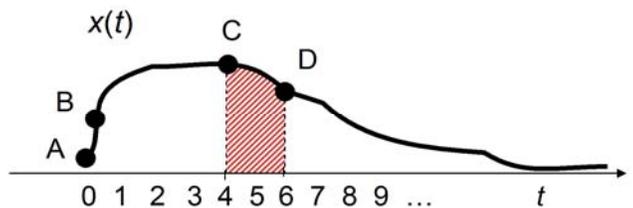
23. Sketch a plot of voltage signal $1 - e^{-t}$ for $t \geq 0$. Label the axes.

A function $x(t)$ is plotted to the right. Use it to answer the remaining questions.



24. At which point (A, B, C, D) is the first derivative equal to 0? $\underline{\hspace{2cm}}$

25. At which point(s) is the first derivative positive? $\underline{\hspace{2cm}}$



26. Write an expression to find the area of the shaded region.