Name _____ Fall Semester 2013

EE 331 – BCT #2, v1

1. What is the circumference of a circle of radius r m?

2. What is the surface area of a sphere of radius r m?

3. Write down Euler's rule (also called Euler's identity or Euler's law).

4. Sketch $y = \sinh x$.

5. Sketch $y = e^{-x}$ for $x \geq 0$.

Evaluate, simplify, convert to or from phasor form, or identify the following (eliminate any complex denominators):

6. $e^a + e^b =$

7. $(\widehat{\mathbf{a}}_x \times \widehat{\mathbf{a}}_y) \cdot \widehat{\mathbf{a}}_z =$

8. $\dfrac{2+3j}{1-j} =$

9. $\dfrac{e^{jx} + e^{-jx}}{2} =$

10. $-\dfrac{d(1/x^2)}{dx} =$

11. $\dfrac{d(\sin x(e^{-x^2}))}{dx} =$

12. $\int \sin x \, dx =$

13. $\int_{-a}^{a} \dfrac{\sin x}{\sqrt{x^2+4}} \, dx =$

14. $\int \sin x \cos x dx =$

15. $V(z,t) = 2e^{-2z}\cos(4t - 5z + \pi/6)$

16. Write down the sum of the first two *non-zero* terms of the Taylor series for $\sin x$ expanded about 0.

In the final problems, $f(x,y) = x^2 \sin y - e^x$, $\mathbf{A} = -2\hat{\mathbf{a}}_x + 3\hat{\mathbf{a}}_y$, and $\mathbf{B} = 3\hat{\mathbf{a}}_x + 2\hat{\mathbf{a}}_y$.

17. $\dfrac{\partial f(x,y)}{\partial y} =$

18. $\dfrac{\partial^2 f(x,y)}{\partial x \partial y} =$

19. $\mathbf{A} \cdot \mathbf{B} =$

20. $\mathbf{A} + \mathbf{B} =$