**MATH 162 Practice QUIZ VII**

1. Without using l’Hôpital’s rule, find



1. By differentiating an appropriate power series, compute the following sum:



1. By twice differentiating an appropriate power series, compute the following sum:



1. Find the Taylor series of



centered at x = -1.

*Hint:* Let u = x +1; find the Maclaurin series for cos 

1. Let F(x) = x4 ln(1+x2). Find F(2072)(0).

*Hint:* Beginning with a geometric series, find the Maclaurin series expansion of ln(1 + t).

1. State *Euler’s identity*. Use Euler’s identity to express cos (4x) in terms of cos x and sin x.
2. Solve the equation z4 = -1.
3. Solve the equation z3 = i.
4. Simplify each of the following, expressing each answer in the form a + bi.
5. 3(2 – 5i) – 11(3 – 4i)
6. ( 4 + 5i)(1 – 7i)
7. 
8. 
9. (1 + 2i)2
10. 

10. Express each of the following in *polar form*: (a) 1 + i, (b) 3 – 3i,

(c) , (d) 5 + 12i

11. Solve the equation *z5 = 1*. (You should have five solutions.)

12. Using Euler’s formula, express sin 5x in terms of sin x and cos x. (*Hint:* (a+b)5 = a5 + 5a4b + 10a3b2 + 10a2b3 + 5ab4 + b5)

13. Without using L’Hôpital’s rule, find



14. Show that *cosh(x i) = cos x* and that *sinh (x i) = i sin x*.

15. Find the six *sixth roots* of 64.

16. Express the following integral as a power series:



17. Find the first four terms of the binomial series of the function (1 + x2)-1/3.

18. Express as a numerical series:



19. Use an appropriate binomial series to find the first four non-zero terms of the Maclaurin series for arcsin x.

20. (Thomas) Verify the integration formula



where C = C1 + C2i is a complex constant of integration.

Using this formula, evaluate each of the following integrals



21. Express each of the following in the form a + bi

1. i-1
2. (-1)i
3. (1 + i)90
4. 3ei/6
5. 
6. 

22. Using substitution (or any other method that you prefer), evaluate each of the following integrals:















