MTH 162 Homework 10

Do the first five problems. Due: Apr 2, 2014 (Wednesday). Hand in to me during the class.

Compulsory:

Ex 6.6

5–32 ▪ Determine whether each integral is convergent or divergent. Evaluate those that are convergent.

17. $\int_1^{\infty} \frac{\ln x}{x}\, dx$

22. $\int_0^{\infty} \frac{e^x}{e^{2x}+3}\, dx$ (Hint: $e^{2x}=(e^x)^2$)

28. $\int_0^{5} \frac{w}{w-2}\, dw$

41–46 ▪ Use the Comparison Theorem to determine whether the integral is convergent or divergent.

41. $\int_0^{\infty} \frac{x}{x^3+1}\, dx$

42. $\int_1^{\infty} \frac{2+e^{-x}}{x}\, dx$

Recommended: (These types of questions may also appear in the exams)

Ex 6.6

5–32 ▪ Determine whether each integral is convergent or divergent. Evaluate those that are convergent.

5. $\int_3^\infty \frac{1}{(x-2)^{3/2}}\,dx$

6. $\int_0^\infty \frac{1}{\sqrt[4]{1+x}}\,dx$

7. $\int_{-\infty}^0 \frac{1}{3-4x}\,dx$

8. $\int_1^\infty \frac{1}{(2x+1)^3}\,dx$

9. $\int_2^\infty e^{-5p}\,dp$

10. $\int_{-\infty}^0 2^r\,dr$

11. $\int_0^\infty \frac{x^2}{\sqrt{1+x^3}}\,dx$

12. $\int_{-\infty}^\infty (y^3-3y^2)\,dy$

13. $\int_{-\infty}^\infty xe^{-x^2}\,dx$

14. $\int_{-\infty}^\infty x^2e^{-x^3}\,dx$

15. $\int_{-\infty}^0 ze^{2z}\,dz$

16. $\int_{-\infty}^\infty \cos \pi t\,dt$

17. $\int_1^\infty \frac{\ln x}{x}\,dx$

18. $\int_{-\infty}^6 re^{r/3}\,dr$

19. $\int_1^\infty \frac{1}{x^2+x}\,dx$

20. $\int_1^\infty \frac{\ln x}{x^3}\,dx$

21. $\int_{-\infty}^\infty \frac{x^2}{9+x^6}\,dx$

22. $\int_0^\infty \frac{e^x}{e^{2x}+3}\,dx$

23. $\int_0^1 \frac{3}{x^5}\,dx$

24. $\int_2^3 \frac{1}{\sqrt{3-x}}\,dx$

25. $\int_{-2}^{14} \frac{dx}{\sqrt[4]{x+2}}$

26. $\int_6^8 \frac{4}{(x-6)^3}\,dx$

27. $\displaystyle\int_0^9 \frac{1}{\sqrt[3]{x-1}}\,dx$

28. $\displaystyle\int_0^5 \frac{w}{w-2}\,dw$

29. $\displaystyle\int_{-1}^1 \frac{e^x}{e^x-1}\,dx$

30. $\displaystyle\int_0^1 \frac{dx}{\sqrt{1-x^2}}$

31. $\displaystyle\int_0^2 z^2 \ln z\,dz$

32. $\displaystyle\int_0^1 \frac{\ln x}{\sqrt{x}}\,dx$

41–46 ▪ Use the Comparison Theorem to determine whether the integral is convergent or divergent.

41. $\displaystyle\int_0^\infty \frac{x}{x^3+1}\,dx$

42. $\displaystyle\int_1^\infty \frac{2+e^{-x}}{x}\,dx$

43. $\displaystyle\int_1^\infty \frac{x+1}{\sqrt{x^4-x}}\,dx$

44. $\displaystyle\int_0^\infty \frac{\arctan x}{2+e^x}\,dx$

45. $\displaystyle\int_0^1 \frac{\sec^2 x}{x\sqrt{x}}\,dx$

46. $\displaystyle\int_0^\pi \frac{\sin^2 x}{\sqrt{x}}\,dx$