MATH 253 (PHILLIPS) MIDTERM 0 EXTRA PROBLEM LIST:
SECOND SET

1. Find $\int x(63 - 2x^2)^{30} \, dx$.

2. Find all real numbers $v$ such that $|7 - v| < 4$.

3. Determine whether the improper integral $\int_{6}^{\infty} \frac{2}{t + x^{1/2}} \, dx$ converges. Show your work; it must be correct to get credit for this problem. (No partial credit!) You need not actually evaluate the integral.

4. Find all real numbers $y$ such that $3 + y^2 < 17$.

5. Find $\int z \sin(z^2 + 3) \, dz$.

6. Find $\frac{d}{dx} \left( \int_{3}^{x} \arctan(7e^{t^2} + 3t + 1) \, dt \right)$.

7. Determine whether the improper integral $\int_{9}^{\infty} \frac{1}{5x^{3/4} - 1} \, dx$ converges. Show your work; it must be correct to get credit for this problem. (No partial credit!) You need not actually evaluate the integral.

8. Find $\int (4x + 18)^{10} \, dx$.

9. Determine whether the improper integral $\int_{5}^{\infty} \frac{1}{3\sqrt{2} - 2} \, dx$ converges. Show your work; it must be correct to get credit for this problem. (No partial credit!) You need not actually evaluate the integral.

10. Find $\int \frac{x^3}{\sqrt{x^4 + 11}} \, dx$.

11. Find $\frac{d}{dt} \left( \int_{t}^{32} \frac{3}{\sqrt{1 + 2q^2 + q^{10}} \, dq} \right)$.

12. Find $\int x(10x^2 + 28)^{3} \, dx$. 
13. Find all real numbers $x$ such that $|x + 9| < 5$.

14. Determine whether the improper integral $\int_{4}^{\infty} \frac{9}{2 + x^7} \, dx$ converges. Show your work; it must be correct to get credit for this problem. (No partial credit!) You need not actually evaluate the integral.

15. Find $\int (13 - 3x)^{99} \, dx$.

16. Find $\frac{d}{dt} \left( \int_{\sqrt{t}}^{t} y^2 \arcsin(e^{-y^2}) \, dy \right)$.

17. Find all real numbers $x$ such that $|10 + x| \leq 2$.

18. Find $\int \sin(3 - 8t) \, dt$.

19. Determine whether the improper integral $\int_{3}^{\infty} \frac{3}{2 + x + x^4} \, dx$ converges. Show your work; it must be correct to get credit for this problem. (No partial credit!) You need not actually evaluate the integral.

20. Find $\frac{d}{dx} \left( \int_{3}^{x} y^2 \sin(y) \, dy \right)$.

21. Find all real numbers $t$ such that $|t - 5| \leq 3$.

22. Determine whether the improper integral $\int_{14}^{\infty} \frac{1}{5x^{3/5} - 6} \, dx$ converges. Show your work; it must be correct to get credit for this problem. (No partial credit!) You need not actually evaluate the integral.

23. Find $\int t^{\frac{3}{2}}(21 - t^2) \, dt$.

24. Find all real numbers $z$ such that $z^2 - 17 \leq 2$. 