

Math 2254 Test # 2

For 1-3, Use L'Hopital's Rule to evaluate the limits.

1. $\lim_{x \rightarrow 0} \frac{\cos 3x - 1}{x^2}$ 2. $\lim_{x \rightarrow \infty} \frac{x^2}{e^{2x}}$ 3. $\lim_{x \rightarrow \infty} (x)^{\frac{1}{x}}$

For 4-6, determine whether the improper integrals converge or diverge. Evaluate the integrals that converge.

4. $\int_1^{\infty} \frac{6}{x^5} dx$ 5. $\int_3^4 \frac{1}{(x-3)^{1/4}} dx$ 6. $\int_0^3 \frac{5}{(x-3)} dx$

7. Evaluate the integral by calculator: $\int \frac{2}{1 - \sin 5x} dx$

For 8-14, evaluate the integrals by hand. Do any six of these 7 problems.

8. $\int \sec^4 \theta \tan^5 \theta d\theta$ 9. $\int \sin^2 \frac{x}{5} dx$ 10. $\int \cos^8 x \sin^3 x dx$

11. $\int \frac{\sqrt{x^2 - 16}}{x} dx$ 12. $\int x^5 \ln x dx$ 13. $\int \frac{5x - 11}{x^2 - 3x - 10} dx$

14. $\int \frac{2x-1}{(x-2)^3} dx$