Math 10A with Professor Stankova
Worksheet, Discussion #12; Friday, 9/22/2017
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Taylor Polynomials

Examples

1. Use the second order Taylor series to approximate $\sqrt{17}$.
2. Find the Taylor series for $x^5 + 3x^3 + 2x + 10$.

Problems

3. Use the second order approximation to $\sqrt[3]{28}$.
4. Use the second order approximation to find $\ln 1.1$.
5. Use the second order approximation to find $\sqrt{5}$.
6. Use the second order approximation to find $e^{0.1}$.
7. Use the second order approximation to find $\sec(0.1)$.
8. Use the third order approximation to find $\sin(0.1)$.
9. Use the second order approximation to find $\cos(0.1)$.

Newton's Method

Examples

10. Find the roots of $f(x) = x^3 - x + 1$.

Problems

11. Use Newton's method to estimate $\sqrt[4]{16.32}$.
12. Find the critical points of $g(x) = \sin(x) - x^2$
13. Find the critical points of $e^x + x^2$.
14. Find when $\cos x = x$.

15. Use Newton's method to estimate $\sqrt[3]{28}$.

16. Use Newton's method with two steps to estimate $\sqrt{5}$.

17. Use Newton's method to estimate $2^{0.1}$.

L'Hopital's Rule

Examples

18. Find $\lim_{x\to\infty}\left(1+\frac{1}{2x}\right)^{3x}$.

19. Find $\lim_{x\to\infty}(x^2-\ln\sqrt{x})$.

Problems

20. Find $\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}$.

21. Find $\lim_{x\to 0}\frac{3^x-2^x}{x^2-x}$.

22. Find $\lim_{x\to 0}\frac{x\tan x}{\sin 3x}$.

23. Find $\lim_{x\to 0}\frac{\sin(x^2)}{x\tan x}$.

24. Find $\lim_{x\to 0}\frac{x^2e^x}{\tan^2 x}$.

25. Find $\lim_{x\to\infty}(\sqrt{x^2+1}-\sqrt{x+1})$.

26. Find $\lim_{x\to 0^+}\ln x\cdot\tan x$.

27. Find $\lim_{x\to 0^+}x^{\sin x}$.