NAME: _____

DATE: _____

REVIEW #1
LIMITS
JCC MAT 1710

Find the limit of each.

1. $\lim_{x\to 1}\dfrac{x^2+1}{x}$
2. $\lim_{x\to 5\pi/3}\cos x$
3. $\lim_{x\to 2}\pi$
4. $\lim_{x\to 5}x$
5. $\lim_{x\to 0}\sqrt{x^2+4}$
6. $\lim_{x\to 0}\sin^2 x$
7. $\lim_{x\to 1}\dfrac{x^2-1}{x-1}$
8. $\lim_{x\to -3}\dfrac{x^2+x-6}{x+3}$
9. $\lim_{x\to 0}\dfrac{\sqrt{x+1}-1}{x}$
10. $\lim_{x\to 0}\dfrac{\frac{1}{x+2}-\frac{1}{2}}{x}$
11. $\lim_{x\to 0}\dfrac{\sin x}{x}$
12. $\lim_{x\to 0}\dfrac{1-\cos x}{x}$
13. $\lim_{x\to 0}\dfrac{\sin 4x}{x}$
14. $\lim_{x\to 0}\dfrac{\tan^2 x}{x}$
15. $\lim_{x\to 0}e^x$
16. $\lim_{x\to \infty}\dfrac{\pi}{x^3}$
17. $\lim_{x\to 3^+}\ln(x-3)$
18. $\lim_{x\to 6^-}(x-6)$
19. $\lim_{x\to 1}\dfrac{1}{x-1}$
20. $\lim_{x\to 4^-}\dfrac{x^2}{x^2-16}$
21. $\lim_{x\to 4^+}\dfrac{x^2}{x^2-16}$

Find any vertical asymptotes.

22. $f(x)=\dfrac{4}{(x-2)^3}$
23. $h(x)=\dfrac{x^2-2}{x^2-x-2}$
24. $g(x)=\dfrac{x+2}{1-x}$

Find the derivative by the <u>definition</u> – not short cut formulas.

25. $f(x)=x^2-2x$
26. $f(t)=\dfrac{2}{t}$
27. $f(x)=\sqrt{x}$

28. Find the slope of the tangent line in #27 at (4, 2).

29. Find the equation of the tangent line in #27 at (4, 2).

Find the limit of each.

30. $\lim_{x\to\infty}\left(5-\frac{2}{x^2}\right)$

31. $\lim_{x\to\infty}\frac{2x-1}{x+1}$

32. $\lim_{x\to\infty}\frac{2x^2+5}{3x^2-1}$

33. $\lim_{x\to\infty}\frac{2x^3+5}{3x^2+1}$

34. $\lim_{x\to\infty}\frac{3x-2}{\sqrt{2x^2+1}}$

35. $\lim_{x\to\infty}\frac{e^x}{2x}$

36. $\lim_{x\to 0}\frac{e^{2x}-1}{x}$

37. $\lim_{x\to\infty}\frac{\ln x}{x}$

38. $\lim_{x\to\infty}\frac{x^2}{e^{-x}}$

39. $\lim_{x\to\infty}\frac{\sqrt{x}}{e^x}$

40. $\lim_{x\to -1}\frac{2x^2-x-3}{x+1}$

41. $\lim_{x\to\infty}\frac{2x+1}{4x^2+2}$