Are you Ready for Calculus 2?

1. $\lim_{x\to\infty}\dfrac{3x^2-5x+7}{\sqrt{3+2x^3+13x^4}}$

2. $\lim_{x\to 0}\dfrac{\cos x+\sin 9x-1}{x}$

3. Given $f(x)=\begin{cases}\ln x & , \quad x>0\\ -4 & , \quad x=0\\ \dfrac{1}{x} & , \quad x<0\end{cases}$, find (a) $\lim_{x\to 0^-} f(x)$, (b) $\lim_{x\to 0^+} f(x)$, and (c) $\lim_{x\to 0} f(x)$

4. Write the equation of the tangent line for $y=\dfrac{x^2-7}{2x-3}$ at $x=-2$.

5. Given $y=e^{x\cos x}+3\ln\sqrt{x}$ find $\frac{dy}{dx}$

6. Given $x^2-4xy=2y+2$, find $\frac{d^2y}{dx^2}$

For #7-11, Solve

7. $\sec^2 x=\sec x+2, 0\le x<2\pi$

8. $\sin^2 x+\cos 2x=\cos x, 0\le x<2\pi$

9. $\log x+\log(x+3)=1$

10. $\sqrt{4r+13}=2r-1$

11. $\dfrac{2}{x+3}-\dfrac{5}{x-1}=\dfrac{1}{3-2x-x^2}$

For #12- 16, sketch the graph and identify the domain and range

12. $f(x)=(x+3)^2-4$

13. $y=\ln(x-1)$

14. $f(x)=\dfrac{x}{x-2}$

15. $f(x)=x^3+3x^2-16x-48$

16. Graph both $f(x)=\sin x$ and $g(x)=\cos x$ on the same coordinate plane

17. Determine the points of intersection(s) for $f(x)=2x-x^2$ and $g(x)=3x^3-x^2-10x$

18. Write the first five terms of the sequence: $a_n=\dfrac{3^n}{n!}$

For #19-21, find the sum of the series:

19. $\sum_{k=0}^{3}\left(\frac{2}{3}\right)^k$

20. $\sum_{n=1}^{4}\left(\frac{1}{n}-\frac{1}{n+1}\right)$

20. $\sum_{n=0}^{\infty}3\left(\frac{1}{4}\right)^n$ $given$ $\sum_{n=0}^{\infty}a_1r^n, |r|<1$ $then\, S=\dfrac{a_1}{1-r}$