CALCULUS CH.9 WS (9.7 - 9.10) **NAME** _____

1) Given the Taylor series $f(x)=8-7(x-4)-2(x-4)^2+5(x-4)^3+.....$

Find each of the following: $f'(4)=$ $f'''(4)=$

Determine the center, radius of convergence and interval of convergence of the series

2) $\sum_{n=0}^{\infty}\frac{n!(x+12)^n}{9^n}$.

3) $\sum_{n=1}^{\infty}\frac{(-1)^{n+1}(x-3)^n}{n\,8^n}$.

center:
radius:
interval of convergence:

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Find a power series for the function, centered at c, and determine the interval of convergence.

4) $f(x)=\frac{1}{7x-2}$, $c=0$

5) $f(x)=\frac{5}{-12-6x}$, $c=-8$

Find the 3rd degree Taylor polynomial centered at c for #6 - 7.

6) $f(x)=3^x$; $c=0$

6b) Use your series to approximate $3^{0.3}$

7) $f(2)=9$ $f'(2)=-5$ $f''(2)=-4$ $f'''(2)=10$

Given $f(x)$ and $g(x)$, find each of the following equations.

$f(x)=\dfrac{1}{1+x} \quad = \quad 1-x+x^2-x^3+x^4+\cdots$

$g(x)=\cos x \ = 1-\dfrac{x^2}{2!}+\dfrac{x^4}{4!}-\dfrac{x^6}{6!}+$

Write out each new series using the given series.

8) $\dfrac{2x}{1+x^2}=$

9) $\sin 7x=$

10) $\cos 3x=$

11) $\ln\left(1+x^2\right)$

Put in summation notation.

8) $\dfrac{2x}{1+x^2}=$

9) $\sin 7x=$

10) $\cos 3x=$

11) $\ln\left(1+x^2\right)$

12) Use Taylor series to approximate

$$\int_0^{\pi/6} \cos 3x\, dx =$$