Senior Analysis Name _____

Lectures 13a-15 Review

Find the following

1. $\lim_{x\to\infty} \dfrac{7x^2-13x-87}{5x^2+33x-110}$

2. $\lim_{x\to\infty} \dfrac{3x(x^2-3x)^4}{(3x^3+15)^4}$

3. $\lim_{x\to\infty} \dfrac{(2x^3+12x^2-88)(3x^4-x^5)}{(6x^4-36)^2}$

4. $\lim_{x\to\infty} \dfrac{(3x^2+1)^6}{6x^8+1}$

5. $\lim_{x\to\infty} \dfrac{2x-6}{3x+5}+\dfrac{3-x}{1-2x}$

6. $\lim_{x\to\infty} \dfrac{4x^2-3}{x^2+2}+\dfrac{2x+5}{2x-5}$

7. $\lim_{x\to\infty} \dfrac{4x-3}{16x^3+2}\cdot\dfrac{3x^3+1}{2x^5-5}$

8. $\lim_{x\to\infty} \dfrac{(x-6)^2}{4x-4}\cdot\dfrac{(5x^2+1)^2}{(3x-1)^3}\cdot\dfrac{1}{x}$

9. $\lim_{x\to\infty} \left(\dfrac{1}{x}+12\right)-\left(2-\dfrac{5}{x^3}\right)$

10. $\lim_{x\to\infty} \left(\dfrac{1}{x}+x^7\right)\cdot\left(5-\dfrac{2}{x}\right)$

11. $\lim_{x\to\infty} \left(\dfrac{2x-6}{5x^6+5}\right)\left(\dfrac{15x^7+23}{x^2+1}\right)$

12. $\lim_{x\to\infty} \dfrac{(3x^2-5)^4}{x(2x^3-1)^2}$

13. $\lim_{x\to\infty} \left(\dfrac{1}{x}+\dfrac{11}{x^3}\right)(2x-9)$

14. $\lim_{x\to\infty} \dfrac{8-4x^2}{\sqrt{x^4+1}+7x^2}$

15. $\lim_{x\to\infty} \dfrac{3x^2+1}{x-5}-\dfrac{3x^2-6}{x+3}$

16. $\lim_{x\to\infty} \sqrt{16x^2+9x}-\sqrt{16x^2}$

17. $\sum_{k=1}^{\infty}\left(\dfrac{2}{3}\right)^{k-2}$

18. $\sum_{k=-3}^{\infty} 6\left(-\dfrac{1}{2}\right)^{k+3}$

19. $\sum_{k=1}^{\infty} \dfrac{1}{26}\left(\dfrac{13}{2}\right)^{k}$

20. $10+5+2.5+1.25+....$

21. Find x so that the given infinites series converges(i.e. has a sum)

$$2+4(1-2x)+8(1-2x)^2+16(1-2x)^3+...$$

22. Find the first three terms of the infinite GP in which $a = 21$ and $S = \frac{63}{4}$

23. A triangle has all sides of 24. The midpoints of each side are connected to form another triangle. The midpoints of each side of this triangle are connected to form another triangle. If this process is continued endlessly, find the sum of the perimeters of all the triangles.

24. The sum of the first two terms of a GP is 2, and the third term is 1. Find the sum of the infinite sequence.

Answers:

1. $\frac{7}{5}$	2. 0	3. $-\frac{1}{18}$	4. ∞	5. $\frac{7}{6}$	6. 5
7. 0	8. $\frac{25}{108}$	9. 10	10. ∞	11. 6	12. ∞
13. 2	14. $-\frac{1}{2}$	15. 24	16. $\frac{9}{8}$	17. $\frac{9}{2}$	18. 4
19. dne	20. 20	21. $\frac{1}{4}<x<\frac{3}{4}$	22. $21,-7,\frac{7}{3}$	23. 144	24. $\frac{8}{3}$