

Homework 14.4: Limits at Infinity; Limits of Sequences
For credit, please show work and answers on separate paper

#1-2 a) Use the graph of f to find the following limits.

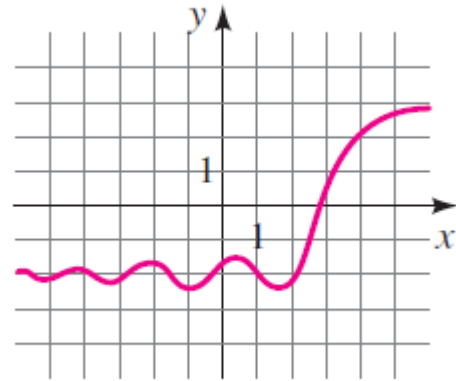
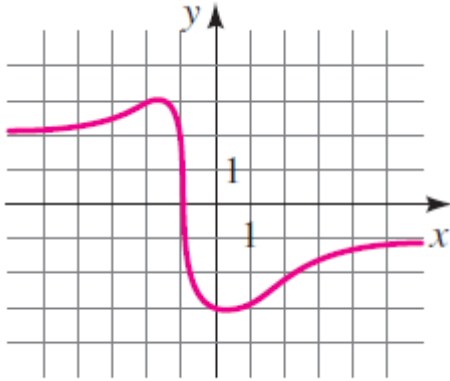
i) $\lim_{x \rightarrow \infty} f(x)$

ii) $\lim_{x \rightarrow -\infty} f(x)$

b) State the equations of the horizontal asymptotes.

1.

2.



#3-7 Find the limit.

3. $\lim_{x \rightarrow \infty} \frac{3}{x^4}$

5. $\lim_{x \rightarrow \infty} \frac{4x^2 + 1}{2 + 3x^2}$

7. $\lim_{x \rightarrow \infty} \cos x$

4. $\lim_{x \rightarrow \infty} \frac{2x+1}{5x-1}$

6. $\lim_{x \rightarrow \infty} \frac{x^4}{1-x^2+x^3}$

#8-9 Use graphing calculator to estimate limit.

8. $\lim_{x \rightarrow \infty} (\sqrt{9x^2 + x} - 3x)$

9. $\lim_{x \rightarrow \infty} \frac{x^5}{e^x}$

#10-14 Determine if the sequence is convergent or divergent, if it is convergent, find its limit.

10. $a_n = \frac{1+n}{n+n^2}$

13. $a_n = \frac{24}{n^3} \left[\frac{n(n+1)(2n+1)}{6} \right]$

11. $a_n = \frac{n^2}{n+1}$

14. $a_n = \frac{12}{n^4} \left[\frac{n(n+1)}{2} \right]^2$

12. $a_n = \cos n\pi$