

Travis, Trip, Taylor

### (11.1) Sequences examples

$$13) \left\{ 1, \frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{9}, \dots \right\} = \frac{1}{2n-1}$$

$$17) \left\{ \frac{1}{2}, -\frac{4}{3}, \frac{9}{4}, -\frac{16}{5}, \frac{25}{6}, \dots \right\} = \frac{(-1)^{n+1} n^2}{n+1}$$

$$25) a_n = \frac{3 + 5n^2}{n + n^2} \rightarrow \lim_{n \rightarrow \infty} \frac{3 + 5n^2}{n + n^2}$$

$$\stackrel{\text{L'H}}{=} \lim_{n \rightarrow \infty} \frac{10}{2} = 5$$

$$27) a_n = e^{1/n} \quad e^{\lim \frac{1}{n}} = e^0 = 1$$

$$31) a_n = \frac{n^2}{\sqrt{n^3 + 4n}} \quad \lim_{n \rightarrow \infty} = \frac{2n}{\frac{1}{2}(n^3 + 4n)^{-1/2} (3n^2 + 4)}$$

$$\lim_{n \rightarrow \infty} = \frac{4n(n^3 + 4n)^{1/2}}{3n^2 + 4} = \frac{4n(n^3 + 4n)^{-1/2}}{3n^2 + 4}$$

Diverges

$$33) a_n = \frac{(-1)^n}{2(n)^{1/2}} \quad \frac{\ln |1| (-1)^n}{2n^{1/2}} = \infty$$



11.1  
13.  $\{1, \frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{9}, \dots\}_{n=1}$   $a_n = \frac{1}{2n-1}$

$a_1 = 1$   
 $a_2 = \frac{1}{3}$

17.  $\{\frac{1}{2}, -\frac{4}{3}, \frac{9}{4}, -\frac{16}{5}, \frac{25}{6}\}$   $a_n = \frac{(-1)^{n+1} n^2}{n+1}$

25.  $a_n = \frac{3+5n^2}{n+n^2}$  Converges  
 $\lim_{n \rightarrow \infty} \frac{3+5n^2}{n+n^2} \stackrel{LH}{=} \frac{10n \cdot \frac{1}{n}}{1+2n \cdot \frac{1}{n}} = \frac{10}{\frac{1}{n}+2} = \frac{10}{2} = 5$

27.  $a_n = e^{1/n}$

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11.1 (3-9-15)

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$$(13) \frac{1}{2n-1}$$

$$(17) \frac{(-1)^{n+1} n^2}{n+1} \quad 1/2, -4/3, 9/4$$

$$(25) a_n = \frac{\cancel{8} + 5n^2}{n+n^2} \text{ converges to } 5$$

$$(27) a_n = e^{1/n} \text{ converges to } 1 \text{ because } e^0 = 1$$

$$(31) a_n = \frac{n^2}{\sqrt{n^3+4n}} \text{ divergent because } \frac{n^2}{n^{3/2}} = \text{divergent}$$

$$(33) \frac{(-1)^n}{2\sqrt{n}} \text{ converges to } 0 \text{ because } \frac{1}{n} = 0$$

$$(41) n^2 e^{-n} \text{ converges to } 0 \text{ because } \frac{n^2}{e^n} = 0$$

