
MATH 1 LECTURE 11 EXERCISES

WEDNESDAY 10-05-16

For each sequence given below determine if the sequence is monotone (and if so (weakly) increasing or (weakly) decreasing), if the sequence is bounded (and if so provide a bound), and if the sequence is convergent (and if so what its limit is).

(1) $\{1/(n^3)\}_{n=1}^{\infty}$

(2) $\{1/(n^{-3})\}_{n=1}^{\infty}$

(3) $\{1/(n^p)\}_{n=1}^{\infty}$ for p in \mathbb{R} .

(4) $\{0, 1, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, \dots\}$

(5) $\{0, 1, 0, 0, 1/2, 0, 0, 0, 1/3, 0, 0, 0, 0, 1/4, \dots\}$

(6) $\{0.9, 0.99, 0.999, 0.9999, \dots\}$

$$(7) \{(-1)^n\}_{n=1}^{\infty}$$

$$(8) \{(-1)^n/n\}_{n=1}^{\infty}$$

$$(9) \{\cos(n\pi)/n\}_{n=1}^{\infty}$$

$$(10) \left\{ \frac{n+1}{n-1} \right\}_{n=2}^{\infty}$$

$$(11) \left\{ \frac{2n^2 + n + 5}{31n^2 + 100n + 82364} \right\}_{n=1}^{\infty}$$

$$(12) \left\{ \frac{(2n-1)(1-5n)}{2n(n+1)} \right\}_{n=1}^{\infty}$$

$$(13) \left\{ e^{(-n^2)} \right\}_{n=1}^{\infty}$$

$$(14) \left\{ \log_e \left(\frac{1}{n} \right) \right\}_{n=1}^{\infty}$$

$$(15) \left\{ 2 \cdot 3^n \right\}_{n=0}^{\infty}$$

$$(16) \left\{ 2 \cdot \left(\frac{1}{3} \right)^n \right\}_{n=0}^{\infty}$$

$$(17) \left\{ \tan \left(\frac{\pi}{2} - \frac{1}{n} \right) \right\}_{n=1}^{\infty}$$

$$(18) \left\{ \sqrt{n+1} - \sqrt{n} \right\}_{n=1}^{\infty}$$