

Esercizi sulla Topologia della Retta

Determinare il derivato, la chiusura e la frontiera dei seguenti sottoinsiemi di \mathbf{R} , e determinare se questi insiemi sono aperti o chiusi.

1. $A = \left\{ \frac{1}{n+2} : n \in \mathbf{N} \right\}$
2. $A = (-2, 0] \cup [1, +\infty)$;
3. $A = [-3, 0] \cup \left\{ \frac{1}{n^2+3} : n \in \mathbf{N} \right\}$;
4. $A = \mathbf{Q} \cap [0, 4]$.
5. $A = [0, 2] - \mathbf{Q}$.
6. $A = \left\{ \frac{(-1)^{n-1}(n^2+2)}{2n+n^2} : n \in \mathbf{N} \right\}$
7. $A = \left\{ \left(1 + \frac{1}{n}\right)^n : n \in \mathbf{N} \right\}$;
8. $A = \left\{ \frac{n^3+4n+5}{5n^2+n} : n \in \mathbf{N} \right\}$
9. $A = \{ \sqrt[n]{n!} : n \in \mathbf{N} \}$;
10. $A = [0, 2) \cup (2, 5] \cup \{6\}$;
11. $A = \{x \in \mathbf{R} : |x - 5| > 2\}$;
12. $A = \{x \in \mathbf{R} : 1 \leq |x - 1| < 2\}$;
13. $A = \{x \in \mathbf{R} : 0 < |x + 5| \leq 2\}$;
14. $A = \{x \in \mathbf{R} : x^2 + x > 2\}$;
15. $A = \{x \in \mathbf{R} : 0 < x + |x + 4| \leq 2\}$;
16. $A = \{2, 3, 70\}$;
17. $A = \mathbf{N} \cup (1, 2)$;
18. $A = \left\{ \frac{n}{n+1} : n \in \mathbf{N} \right\} \cup (1, 3)$;
19. $A = \emptyset$;
20. $A = \mathbf{R}$;
21. $A = \{n^{1993} : n \in \mathbf{N}\}$.