

More complicated limits

1. $\lim_{n \rightarrow \infty} \frac{n + \cos(n!)}{2n+1}$
2. $\lim_{n \rightarrow \infty} \frac{\arctan(n^2)}{n+1}$

Functions

1. Are the following functions odd or even?

- (a) $f(x) = \sin(x^2) + |x|$
- (b) $f(x) = \tan(4x)$
- (c) $f(x) = x + x^2$

2. Are the following functions periodic?

- (a) $f(x) = \cos^2(\frac{x}{2})$
- (b) $f(x) = \arctan(\tan(x))$
- (c) $f(x) = \tan(\arctan(x))$

3. Sketch a graph of a given function, find its Domain of definition and Range:

- (a) $f(x) = (x - 3)^2$
- (b) $f(x) = e^{-x/2}$
- (c) $f(x) = |x| + 5$
- (d) $f(x) = \ln(x + 1) + 2$
- (e) $f(x) = \arctan(x)$
- (f) $f(x) = 2 \arctan(x) + \pi$
- (g) $f(x) = \arccos(\frac{x}{2}) - \frac{\pi}{2}$
- (h) $f(x) = \arcsin(x - 5)$

Find (a) Domain of definition ($\mathcal{D}(f)$) and Range of the given function, (b) compute limits in boundary points of $\mathcal{D}(f)$.

4. $f(x) = \ln(x - \sqrt{x+1})$
5. $f(x) = \arccos \frac{1-2x}{4}$
6. $f(x) = \ln(x+3) + \sqrt{5-2x}$