

Exercise 6

Evaluate the limit and justify each step by indicating the appropriate Limit Law(s).

$$\lim_{u \rightarrow -2} \sqrt{u^4 + 3u + 6}$$

Solution

$$\lim_{u \rightarrow -2} \sqrt{u^4 + 3u + 6}$$

Use the root law.

$$\sqrt{\lim_{u \rightarrow -2} (u^4 + 3u + 6)}$$

The limit of a sum is the sum of the limits.

$$\sqrt{\lim_{u \rightarrow -2} u^4 + \lim_{u \rightarrow -2} 3u + \lim_{u \rightarrow -2} 6}$$

The limit of a constant times a function is the constant times the limit of the function.

$$\sqrt{\lim_{u \rightarrow -2} u^4 + 3 \lim_{u \rightarrow -2} u + \lim_{u \rightarrow -2} 6}$$

Evaluate the limits.

$$\begin{aligned} &\sqrt{(-2)^4 + 3(-2) + 6} \\ &\quad \sqrt{16} \\ &\quad 4 \end{aligned}$$