

Exercise 37

If $4x - 9 \leq f(x) \leq x^2 - 4x + 7$ for $x \geq 0$, find $\lim_{x \rightarrow 4} f(x)$.

Solution

Since

$$4x - 9 \leq f(x) \leq x^2 - 4x + 7$$

and

$$\lim_{x \rightarrow 4} (4x - 9) = \lim_{x \rightarrow 4} (x^2 - 4x + 7) = 7,$$

then

$$\lim_{x \rightarrow 4} f(x) = 7$$

by the squeeze theorem. The graph below illustrates the two bounding functions.

