

213 Problem Set 2 Solutions

§2.3 9. The first step is computing the requested eight values, each with eight decimal places. Then the next step is to see what they are approaching. For notation purpose, I will call $k(x) = \frac{x^2-4}{x^2+x-6}$.

Values: $k(1.9) = 0.79591837$, $k(1.99) = 0.79959920$, $k(1.999) = 0.79995999$, $k(1.9999) = 0.79999600$ and from the other side, $k(2.1) = 0.80392157$, $k(2.01) = 0.80039920$, $k(2.001) = 0.80003999$, $k(2.0001) = 0.80000400$. This should be pretty obvious that the values are getting close to 0.8, or $\frac{4}{5}$. Thus we believe $\lim_{x \rightarrow 2} = \frac{4}{5}$.

§2.3 27. There's not much to say here. I hope we've done enough of these by now that they are familiar. As you trace the blue graph from the right, the graph comes down, crosses the axis, and seems to be heading to -4 . The fact that there is a solid circle there is irrelevant. If there were an empty circle, the limit would still be heading to -4 . Limits are about where it is heading, not where it is. This is all lots of words to say the relatively unsurprising $\lim_{x \rightarrow 0^+} f(x) = -4$.