I'll start by showing you the traditional method, but then I'll explain what's really going on and show you how you can do it in your head. It'll be easy!

Given some polynomial guy

\[ f(x) = \frac{a x^n + \ldots}{b x^m + \ldots} \quad \text{\textmd{nth degree polynomial}} \]

\[ \text{\textmd{mth degree polynomial}} \]

1. If \( n < m \), then the x-axis is the horizontal asymptote.

2. If \( n = m \), then the horizontal asymptote is the line
   \[ \gamma = \frac{a}{b} \]

3. If \( n > m \), then there is no horizontal asymptote. (There is a slant diagonal or oblique asymptote.)

Yeah, yeah, you COULD just memorize these things... but it's way better to KNOW what's going on. Then you can just do it.

What we're really doing is some quick long division to divide the denominator into the numerator. The cool thing is that we only need to do the first part -- no remainder crud! And we can do it in our heads!