

(1) Let $f(x) = \frac{2x^2 - 18}{x^2 - 4x - 5}$.

(a) Find the vertical and horizontal asymptotes.

$$x^2 - 4x - 5 = (x-5)(x+1) \quad \text{vertical asymptotes at } x=5, x=-1$$

horizontal asymptotes: $\frac{2x^2}{x^2} = 2 \quad \therefore y=2$

leading terms have \rightarrow
equal degree.

(b) Find the intercepts with the x -axis and y -axis.

y -intercept: $f(0) = \frac{-18}{-5} = \frac{18}{5}$

x -intercepts: $2x^2 - 18 = 2(x^2 - 9) = 2(x-3)(x+3) \quad x=3, x=-3$

(c) Sketch the graph of $y = f(x)$.

