


IB Math: Limit as $x \rightarrow \infty$ or as $x \rightarrow$ vertical asymptote Name: key

Period: _____

<p>1. $f(x) = \frac{x+2}{3x-5}$</p> <p>Find the Horizontal/Oblique Asymptote $y = \underline{\frac{1}{3}}$</p> <p>Evaluate $\lim_{x \rightarrow \infty} \frac{x+2}{3x-5} = \underline{\frac{1}{3}}$</p>	<p>2. $f(x) = \frac{x^2-4x+3}{2x^2+10}$</p> <p>Find the Horizontal/Oblique Asymptote $y = \underline{\frac{1}{2}}$</p> <p>Evaluate $\lim_{x \rightarrow \infty} \frac{x^2-4x+3}{2x^2+10} = \underline{\frac{1}{2}}$</p>
<p>3. $f(x) = \frac{-4x+3}{x^2-2x+6}$</p> <p>Find the Horizontal/Oblique Asymptote $y = \underline{0}$</p> <p>Evaluate $\lim_{x \rightarrow \infty} \frac{-4x+3}{x^2-2x+6} = \underline{0}$</p>	<p>4. $f(x) = \frac{2x^2+x-1}{x+2}$</p> <p>Find the Horizontal/Oblique Asymptote $y = \underline{2x-3}$</p> <p>Evaluate $\lim_{x \rightarrow \infty} \frac{2x^2+x-1}{x+2} = \underline{\infty}$</p>
<p>5. $f(x) = \ln x$</p> <p>Find the vertical Asymptote $x = \underline{0}$</p> <p>Evaluate $\lim_{x \rightarrow 0^+} \ln x = \underline{-\infty}$</p> <p>6. $f(x) = (0.5)^x$</p> <p>Find the Horizontal Asymptote $y = \underline{0}$</p> <p>Evaluate $\lim_{x \rightarrow \infty} (0.5)^x = \underline{0}$</p> 	<p>7. $f(x) = \frac{x+2}{3x-5}$</p> <p>Find the Vertical Asymptote $x = \underline{\frac{5}{3}}$</p> <p>Evaluate $\lim_{x \rightarrow \frac{5}{3}^+} \frac{x+2}{3x-5} = \underline{\infty}$</p> <p>Evaluate $\lim_{x \rightarrow \frac{5}{3}^-} \frac{x+2}{3x-5} = \underline{-\infty}$</p>

Evaluate the limit.

1. $\lim_{x \rightarrow \infty} \frac{x}{x+2} = 1$ (H.A: $y=1$)

3. $\lim_{x \rightarrow \infty} \frac{8x^2}{5x^2+7} = \frac{8}{5}$ (H.A: $y = \frac{8}{5}$)

5. $\lim_{x \rightarrow \infty} \frac{x^4}{6x^5+7} = 0$ (H.A: $y=0$)

7. $\lim_{x \rightarrow \infty} \frac{4x^3}{x^2+700} = \infty$ (Oblique Asym.)

9. $\lim_{x \rightarrow \infty} \log(x) = \log(\infty) = \infty$

11. $\lim_{x \rightarrow \infty} \sec\left(\frac{1}{x}\right) = \sec\left(\frac{1}{\infty}\right) = \sec(0) = 1$

13. $\lim_{x \rightarrow \infty} \frac{\sin x}{x} = 0$

2. $\lim_{x \rightarrow \infty} \frac{2x}{3x+1} = \frac{2}{3}$ (H.A: $y = \frac{2}{3}$)

4. $\lim_{x \rightarrow \infty} (0.99)^x = 0$ (H.A: $y=0$)

6. $\lim_{x \rightarrow \infty} \frac{x^2+9999}{x^3+7} = 0$ (H.A: $y=0$)

8. $\lim_{x \rightarrow \infty} \frac{5x}{x^{0.5}+10} = \infty$ (oblique Asym.)

10. $\lim_{x \rightarrow \infty} \log\left(\frac{1}{x}\right) = \log\left(\frac{1}{\infty}\right) = \log(0) = -\infty$

12. $\lim_{x \rightarrow \infty} e^{-x} = \frac{1}{e^{\infty}} = 0$

14. $\lim_{x \rightarrow \infty} \frac{\sqrt{8x^2-5x}}{\sqrt{x^2+7x-3}} = \sqrt{\lim_{x \rightarrow \infty} \frac{8x^2-5x}{x^2+7x-3}} = \sqrt{8}$

H.A: $y = \sqrt{8}$