

262. $\lim_{x \rightarrow \infty} \frac{2x-5}{4x}$

263. $\lim_{x \rightarrow \infty} \frac{x^2-2x+5}{x+2}$

264. $\lim_{x \rightarrow -\infty} \frac{3x^3-2x}{x^2+2x+8}$

265. $\lim_{x \rightarrow -\infty} \frac{x^4-4x^3+1}{2-2x^2-7x^4}$

266. $\lim_{x \rightarrow \infty} \frac{3x}{\sqrt{x^2+1}}$

267. $\lim_{x \rightarrow -\infty} \frac{\sqrt{4x^2-1}}{x+2}$

268. $\lim_{x \rightarrow \infty} \frac{4x}{\sqrt{x^2-1}}$

269. $\lim_{x \rightarrow -\infty} \frac{4x}{\sqrt{x^2-1}}$

270. $\lim_{x \rightarrow \infty} \frac{2\sqrt{x}}{x-\sqrt{x}+1}$

For the following exercises, find the horizontal and vertical asymptotes.

271. $f(x) = x - \frac{9}{x}$

272. $f(x) = \frac{1}{1-x^2}$

273. $f(x) = \frac{x^3}{4-x^2}$

274. $f(x) = \frac{x^2+3}{x^2+1}$

275. $f(x) = \sin(x)\sin(2x)$

276. $f(x) = \cos x + \cos(3x) + \cos(5x)$

277. $f(x) = \frac{x \sin(x)}{x^2-1}$

278. $f(x) = \frac{x}{\sin(x)}$

279. $f(x) = \frac{1}{x^3+x^2}$

280. $f(x) = \frac{1}{x-1} - 2x$

281. $f(x) = \frac{x^3+1}{x^3-1}$

282. $f(x) = \frac{\sin x + \cos x}{\sin x - \cos x}$

283. $f(x) = x - \sin x$

284. $f(x) = \frac{1}{x} - \sqrt{x}$

For the following exercises, construct a function $f(x)$ that has the given asymptotes.

285. $x = 1$ and $y = 2$

286. $x = 1$ and $y = 0$

287. $y = 4$, $x = -1$

288. $x = 0$

For the following exercises, graph the function on a graphing calculator on the window $x = [-5, 5]$ and estimate the horizontal asymptote or limit. Then, calculate the actual horizontal asymptote or limit.

289. [T] $f(x) = \frac{1}{x+10}$

290. [T] $f(x) = \frac{x+1}{x^2+7x+6}$

291. [T] $\lim_{x \rightarrow -\infty} x^2 + 10x + 25$

292. [T] $\lim_{x \rightarrow \infty} \frac{x+2}{x^2+7x+6}$

293. [T] $\lim_{x \rightarrow \infty} \frac{3x+2}{x+5}$

For the following exercises, draw a graph of the functions without using a calculator. Be sure to notice all important features of the graph: local maxima and minima, inflection points, and asymptotic behavior.

294. $y = 3x^2 + 2x + 4$

295. $y = x^3 - 3x^2 + 4$

296. $y = \frac{2x+1}{x^2+6x+5}$

297. $y = \frac{x^3+4x^2+3x}{3x+9}$