12-4 Practice Problems

For each problem, find the limit of $f(x)$ as x approaches infinity. Use DESMOS to verify your result.

1. $f(x) = \dfrac{4x^2}{x^2+1}$

2. $f(x) = \dfrac{x^2}{x^2+1}$

3. $f(x) = 4 - \dfrac{1}{x^2}$

4. $f(x) = x + \dfrac{1}{x}$

5. $f(x) = \dfrac{3}{x^2}$

6. $f(x) = \dfrac{5}{2x}$

7. $f(x) = \dfrac{3+x}{3-x}$

8. $f(x) = \dfrac{1-6x}{1+5x}$

9. $f(x) = \dfrac{4x-3}{2x+1}$

10. $f(x) = \dfrac{3x^2+1}{4x^2-5}$

11. $f(x) = \dfrac{x^2}{x+3}$

Answer Key

1. $\lim_{x\to\infty} f(x) = 4$

2. $\lim_{x\to\infty} f(x) = 1$

3. $\lim_{x\to\infty} f(x) = 4$

4. $\lim_{x\to\infty} f(x) = DNE$

5. $\lim_{x\to\infty} f(x) = 0$

6. $\lim_{x\to\infty} f(x) = 0$

7. $\lim_{x\to\infty} f(x) = -1$

8. $\lim_{x\to\infty} f(x) = -\frac{6}{5}$

9. $\lim_{x\to\infty} f(x) = 2$

10. $\lim_{x\to\infty} f(x) = \frac{3}{4}$

11. $\lim_{x\to\infty} f(x) = DNE$