

Graphing Rational Functions

$$f(x) = \frac{p(x)}{q(x)}$$

- Step 1.* Find all vertical asymptotes (Denominator zero)
Step 2. Find horizontal or oblique asymptotes
Step 3. Find the y intercepts, let $x = 0$
Step 4. Find the x intercepts, let $y = 0$
Step 5. Determine if the graph will intersect the horizontal or oblique asymptotes, set eqn = to HA or oblique asymptote
Step 6. Plot selected points in each interval; interval determined by the vertical asymptotes

1. Graph $y = \frac{-2}{x}$ and identify the vertical and horizontal asymptotes.

2. Graph $f(x) = \frac{3}{x}$ and identify the vertical and horizontal asymptotes.

3. Graph $f(x) = \frac{-1}{x} + 2$ and identify the vertical and horizontal asymptotes.

4. Graph

$f(x) = \frac{2}{x} - 3$ and identify the vertical and horizontal asymptotes.

5. Graph $y = \frac{1}{x-2}$ and identify the vertical and horizontal asymptotes.

6. Graph $f(x) = \frac{-2}{x+3}$ and identify the vertical and horizontal asymptotes.

7. Graph $f(x) = \frac{2}{x+1} - 1$ and identify the vertical and horizontal asymptotes.

8. Graph $y = \frac{-3}{x-4} + 2$ and identify the vertical and horizontal asymptotes.

9. Graph $f(x) = \frac{x}{x+3}$ and identify the vertical and horizontal asymptotes.

10. Graph $y = \frac{3x}{x-2}$ and identify the vertical and horizontal asymptotes.

11. Graph $f(x) = \frac{-2x}{x+1}$ and identify the vertical and horizontal asymptotes.

12. Graph $y = \frac{-x}{x-3}$ and identify the vertical and horizontal asymptotes.

13. Graph $f(x) = \frac{2x-3}{x+2}$ and identify the vertical and horizontal asymptotes.

14. Graph $f(x) = \frac{-x+5}{x-1}$ and identify the vertical and horizontal asymptotes.

15. Graph $y = \frac{2x^2}{x^2-4}$ and identify the vertical and horizontal asymptotes.

16. Graph $f(x) = \frac{x^2}{x^2+4}$ and identify the vertical and horizontal asymptotes.

17. Graph $y = \frac{x^2+2}{x}$ and identify the vertical and slant asymptotes.

18. Give the end behavior of $f(x) = \frac{3}{x+2}$ as x approaches ∞ .

19. Give the end behavior of $f(x) = \frac{-5}{x-3}$ as x approaches ∞ .

20. Give the end behavior of $f(x) = \frac{2x+1}{x-3}$ as x approaches ∞ .

21. Give the end behavior of $f(x) = \frac{x+3}{3x+1}$ as x approaches ∞ .

22. Give the end behavior of $f(x) = \frac{-x+2}{2x+1}$ as x approaches ∞ .

23. Give the end behavior of $f(x) = \frac{3x-1}{-5x+2}$ as x approaches ∞ .