

Rational Functions Exercises

For each function, find the x -intercept(s), if any. Remember to factor and cancel whenever possible.

$$[1] f(x) = \frac{x^2 - 9}{x - 3}$$

$$[2] f(x) = \frac{x^3 - 27}{x + 2}$$

$$[3] f(x) = \frac{x^2 + 5x + 6}{x^2 + x - 2}$$

$$[4] f(x) = \frac{x^3 - x}{x^2 - 1}$$

$$[5] f(x) = \frac{x - 4}{x^2 - 16}$$

$$[6] f(x) = \frac{x + 4}{x - 5}$$

For each function, find the x -intercept(s), if any.

$$[7] f(x) = \frac{x^2 - 10}{x - 5}$$

$$[8] f(x) = \frac{x^3 - 27}{x + 3}$$

$$[9] f(x) = \frac{x^2 + x - 3}{x^2 + 2x - 3}$$

$$[10] f(x) = \frac{x^3 - x}{x^2 - 1}$$

$$[11] f(x) = \frac{x + 4}{x^2 + 16}$$

$$[12] f(x) = \frac{x - 4}{x + 5}$$

For each function, find the vertical asymptote(s), if any.

Remember to factor and cancel whenever possible.

$$[13] f(x) = \frac{x - 1}{x^2 + 1}$$

$$[14] f(x) = \frac{x - 1}{x^2 - 1}$$

$$[15] f(x) = \frac{x - 2}{x^2 - 1}$$

$$[16] f(x) = \frac{x^2 - 6x + 8}{x^2 - 4}$$

(note: #14 and #15 have different answers!)

$$[17] f(x) = \frac{x + 4}{x^2 - 16}$$

$$[18] f(x) = \frac{x^2 + 6x + 9}{x^2 - 9}$$

For each function, find the non-vertical asymptote.

$$[19] f(x) = \frac{x-1}{x^2+1}$$

$$[20] f(x) = \frac{3x-1}{2x-1}$$

$$[21] f(x) = \frac{x^3-2}{x^4-1}$$

$$[22] f(x) = \frac{2x^2-6x+8}{x^2-5}$$

$$[23] f(x) = \frac{5x+4}{10x-1}$$

$$[24] f(x) = \frac{x^3+27}{x^3-8}$$

For each function, find the "hole."

$$[25] f(x) = \frac{x+1}{x^2-1}$$

$$[26] f(x) = \frac{x-2}{x^2-4}$$

$$[27] f(x) = \frac{x+4}{x^2+5x+4}$$

$$[28] f(x) = \frac{2x^2-6x+8}{x^2-5}$$