

More Rational Functions and Equations Practice



1) What are the vertical asymptotes for the following function?

$$\frac{4x^2 - 4x - 12}{x^2 - 36}$$

V.A. $x = 6, x = -6$

2) What are the horizontal asymptotes for the following function?

$$\frac{4x^2 - 4x - 12}{x^2 - 36}$$

H.A. $y = 4$

3) If c represents a constant, for what value does the function below have a vertical asymptote of $x = 3$?

$$\frac{6}{cx - 18}$$

$c = 6$

4) If c represents a constant, for what value does the function below have a horizontal asymptote of $y = 3$?

$$\frac{3x^2 + x - 3}{x^c - 1}$$

$c = 2$

5) Find the Domain, Range and asymptotes for the following rational function.

$$f(x) = \frac{1}{x+3} - 6$$

V.A. $x = -3$
H.A. $y = -6$

6) Find the Domain, Range and asymptotes for the following rational function.

$$g(x) = \frac{x^2 - 10x + 24}{x^2 - 24x - 81}$$

D: $\mathbb{R}, x \neq 27, -3$

R: $\mathbb{R}, y \neq 1$

V.A. $x = 27, -3$

H.A. $y = 1$

7) What are the zeros of the following function?

$$f(x) = \frac{6x^2 - 54}{x^2 - 1}$$

$(3, 0) + (-3, 0)$

or

$x = 3, -3$

8) Identify the asymptotes.

$$f(x) = \frac{6x^2 - 54}{x^2 - 1}$$

V.A. $x = 1, x = -1$

H.A. $y = 6$

9) For which values of x is the expression undefined?

$$\frac{6x^2 - 24}{2x^2 - x - 3}$$

undefined when $x = \frac{3}{2} + 1$

10) For which values of x is the expression undefined?

$$\frac{x^2 - 10x + 9}{x^2 + 14x - 32}$$

undefined when $x = -16 + 2$

11) If y varies inversely as x , and $y = 5$ when $x = 3$, write the equation that represents this function.

$$y = \frac{15}{x}$$

12) If y varies directly as x , and $y = 12$ when $x = 2$, write the equation that represents this function.

$$y = 6x$$

13) Solve the following rational equation:

$$\frac{1}{n} + \frac{5}{n^2 + n} = 2$$

$$n = \frac{3}{2} + -2$$

14) Solve the following rational equation:

$$\frac{1}{2k+6} + \frac{1}{2} = \frac{k+4}{2}$$

$$k = -2 + -4$$

15) Solve the following rational equation:

$$\frac{2}{3n^2} + \frac{n-3}{3n} = \frac{2n+2}{n}$$

$$n = \left\{ \frac{1}{5}, -2 \right\}$$

16) For which values of x would this equation be undefined?

$$\frac{x^2 - 36}{x - 6} = x + 6$$

undefined when $x = 6$