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Rational Functions Quiz PDF

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What is a rational function?

◯ A function that is always linear
◯ A function that can be expressed as the quotient of two polynomials
◯ A function with no variables
◯ A function that is always quadratic

The domain of a rational function excludes:

◯ Points where the numerator is zero
◯ Points where the denominator is zero
◯ All real numbers
◯ Points where both numerator and denominator are zero

Vertical asymptotes occur at values of x where:

◯ The numerator is zero
◯ The denominator is zero
◯ Both numerator and denominator are zero
◯ The function is undefined

Explain why a rational function might not have a horizontal asymptote.

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If the degree of the numerator is less than the degree of the denominator, the horizontal asymptote is:

◯ $y = 0$
◯ $y = 1$
◯ $y = \infty$
◯ No horizontal asymptote

Which features can be present in the graph of a rational function? (Select all that apply)

☐ Holes
☐ Vertical asymptotes
☐ Horizontal asymptotes
☐ Parabolas

A hole in the graph of a rational function occurs when:

◯ The numerator is zero
◯ The denominator is zero
◯ Both numerator and denominator are zero at the same point
◯ The function is undefined

Which of the following are types of asymptotes in rational functions? (Select all that apply)

☐ Vertical
☐ Horizontal
☐ Diagonal
☐ Slant

Which of the following values must be excluded from the domain of a rational function? (Select all that apply)

☐ Values that make the numerator zero
☐ Values that make the denominator zero
☐ Values that make both numerator and denominator zero
☐ Values that make the function negative

Rational functions can model which of the following scenarios? (Select all that apply)

☐ Speed and time relationships

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☐ Population growth
☐ Financial profit and loss
☐ Projectile motion

Simplifying a rational function is important for identifying:

◯ The domain
◯ The range
◯ Holes and asymptotes
◯ The degree of the function

Describe the process of finding the vertical asymptotes of a rational function.

Provide an example of a real-world situation that can be modeled by a rational function and explain why.

Discuss how the degrees of the numerator and denominator affect the end behavior of a rational function.

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Given the rational function f(x) = (x^2 - 4)/(x^2 - 1), identify any holes and vertical asymptotes.

Explain how you would identify a hole in the graph of a rational function.

To find the x-intercepts of a rational function, you set:

○ The denominator equal to zero
○ The numerator equal to zero
○ Both numerator and denominator equal to zero
○ The function equal to zero

The end behavior of a rational function is determined by:

○ The coefficients of the numerator
○ The degrees of the numerator and denominator
○ The x-intercepts
○ The y-intercepts

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Simplifying a rational function can help identify: (Select all that apply)

☐ Holes
☐ X-intercepts
☐ Vertical asymptotes
☐ Horizontal asymptotes

A rational function has a horizontal asymptote when: (Select all that apply)

☐ The degree of the numerator is less than the degree of the denominator
☐ The degree of the numerator equals the degree of the denominator
☐ The degree of the numerator is greater than the degree of the denominator
☐ The numerator is a constant

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