

How do you know if a Rational function has a hole?

If the function has a common factor in top and bottom

$$f(x) = \frac{(x+2)(x-3)}{(x+2)(x+3)}$$

hole: at  $x = -2$

How do you determine if a Rational function has a vertical asymptote?

set the denominator = 0 and solve for x.

How do you determine if a Rational function has a horizontal asymptote?

Compare the degree in top & bottom

$$f(x) = \frac{\text{top smaller}}{\text{bottom}} \quad \text{then } y = 0 \quad (\text{J-Lo})$$

$$f(x) = \frac{\text{top equal}}{\text{bottom}} \quad \text{then } y = \frac{\text{leading coeff.}}{\text{leading coeff.}} \quad (\text{Marilyn})$$

$$f(x) = \frac{\text{top larger}}{\text{bottom}} \quad \text{then none} \quad (\text{Dolly})$$