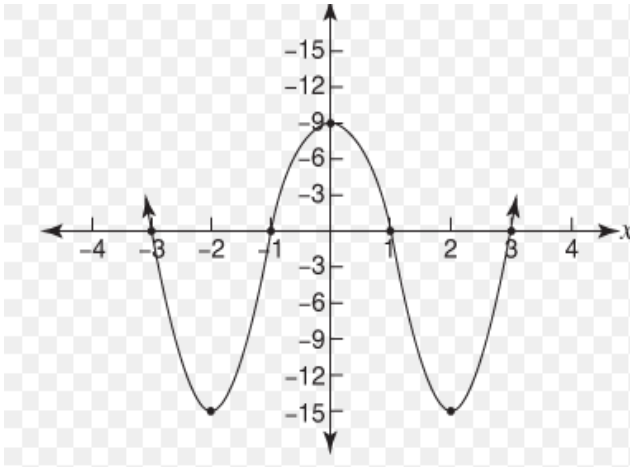
What is the smallest possible degree for this polynomial function? Explain your reasoning.



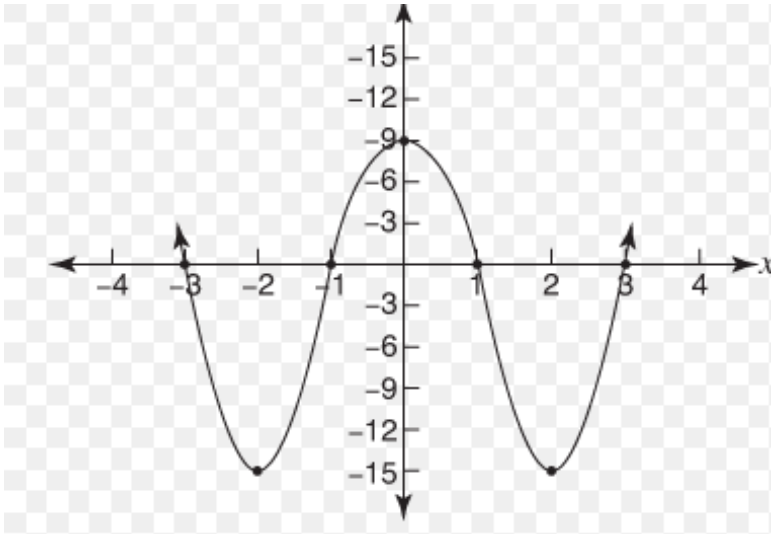
a. Estimate the points for the local minimum(s).

b. Estimate the points for the local maximum(s).

Estimate the Zeros of this function.

Give the end behaviors of the function.

Use the regression capabilities of your calculator to find a polynomial function rule that models the graph pattern. List the points you use as the basis of your regression



Solve each quadratic algebraically. Identify the solution as real or complex. If the solution is complex make sure to write it in the standard form $a \pm bi$.

$2x^2 + 3x = 1$

$2x^2 + 5x = 12$

$x^2 - 10x + 27 = 0$

Write a rule for the quartic function that has zeros only at (-7,0), (-2,0) and (3,0). Then sketch a graph.

Consider the rational function. $f(x) = \frac{3x^2-27}{x^2-16}$.

Find the Domain.

Find the zeros.

Find the y-intercept.

Find all vertical asymptote(s).

Find the horizontal asymptote.

Consider the following expressions. (A) Give the domain. (B) Simplify the expression. (C) Identify what values of *x* (if any) are the original expression and simplified expression not equivalent (Find the hole(s)). Show all work!

$$\frac{x^2-5x+4}{x^2-2x-24} \qquad \frac{x^2-25}{x^2+7x+10} \qquad \frac{x^2+2x-48}{x^2-36} \qquad \frac{x^2-5x+6}{x^2-1}$$

Give everything about the following functions (*Hint*: zeros, asymptotes, intercepts, holes, domain) and sketch a graph. Draw your axis and label your scale

$$f(x) = \frac{x^2 - 6x - 27}{x^2 - 81}$$

Points of Discontinuity:

Zeros:

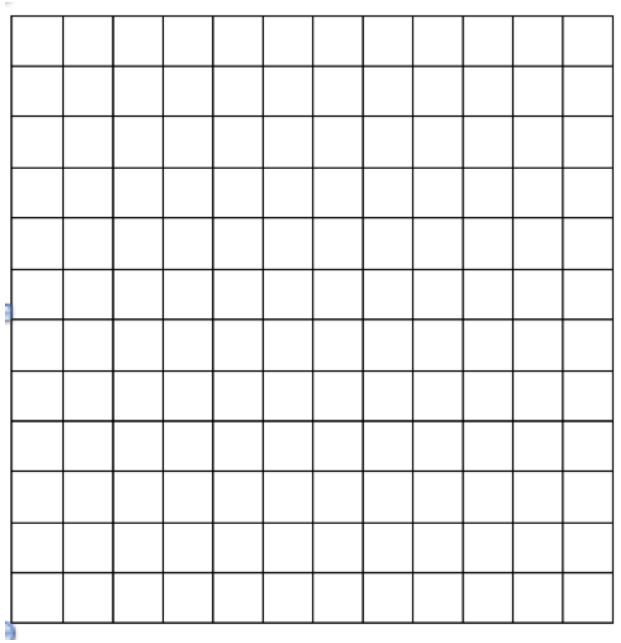
Y-intercepts:

Holes:

Vertical Asymptotes:

Horizontal Asymptotes:

Domain:



Write each sum or difference in a simplified form.

$$\frac{2x+7}{x+3}+\frac{x+5}{x+3}$$

$$\frac{2x^2+4}{x-6}-\frac{x^2-5}{x-6}$$

$$\frac{x-7}{x}-\frac{5}{x+7}$$

Write each sum or difference in a simplified form.

$$\frac{4x}{x^2 - 6x + 9} + \frac{4}{x^2 - 8x + 15}$$

Rewrite each product or quotient in an equivalent simpler form.

$$\frac{x^2-16x+64}{5} \cdot \frac{35}{x-8}$$

$$\frac{4x^2+12x}{7x^2} \div \frac{x^2+7x+12}{14x}$$

Rewrite each product or quotient in an equivalent simpler form.

$$\frac{9x^2 - 15x - 6}{5x^2 + 11x + 2} \cdot \frac{50x^2 - 2}{3x^2 + 10x + 3}$$