

5. Let  $g(x) = x^5 - 50x^3 + 49x$

- What are the roots of  $g(x)$ ?
- Sketch a graph of  $g(x)$ . Label roots and y-intercept.
- Fill in the following table

$x_1$	$x_2$	$\Delta y = y_2 - y_1$	$\frac{\Delta y}{\Delta x}$
0	1		
0	-1		
0	0.1		
0	0.01		
0	0.001		

- What is the instantaneous rate of change at  $x=0$ ?
- Draw the tangent line at  $x=0$

AB LEVEL

Fix Solution

1. Let  $p(x) = \frac{x^4 - 22x^2 - 75}{x^4 + 28x^2 + 75}$  and  $q(x) = \frac{x^4 + x^3 - 2x^2 + 4x - 24}{x^4 + 13x^2 + 36}$

$$q(x) = \frac{(x^2+4)(x+3)(x-2)}{(x^2+9)(x^2+4)}$$

$$p(x) = \frac{(x^2-25)(x^2+3)}{(x^2+25)(x^2+3)}$$

a. Find and simplify  $p(x) + q(x)$

- What is the domain and range of  $p(x) + q(x)$ ?
- What is the end behavior (both directions) of  $p(x) + q(x)$ ?
- What are the roots of  $p(x) + q(x)$ ?
- What are the holes of  $p(x) + q(x)$ ?
- What are the asymptotes of  $p(x) + q(x)$ ?
- Sketch a graph of  $p(x) + q(x)$ .

$$\frac{(x^2+9)}{(x^2+9)} \frac{x^2-25}{x^2+25} + \frac{(x+3)(x-2)}{x^2+9} \frac{(x^2+3)}{(x^2+25)}$$

$$\frac{x^4 - 16x^2 - 225 + x^4 + x^3 + 19x^2 + 25x - 150}{(x^2+9)(x^2+25)}$$

$$\frac{2x^4 + x^3 + 3x^2 + 25x - 375}{x^4 + 34x^2 + 225}$$

roots:  $x = -3.95$   
 $x = 3.263$

