

# Polynomial Graph

Example from Section 3.2

Problem # 50

$$f(x) = -2(x-4)^2(x^2-25)$$

4th Degree Negative coefficient

$$= -2(x-4)^2(x+5)(x-5)$$

a. Falls left + right

b.  $-2(x-4)^2(x+5)(x-5) = 0$

$$x-4=0 \quad x+5=0 \quad x-5=0$$

$$x=4 \quad x=-5 \quad x=5$$

The  $x$ -intercepts are  $(-5, 0)$ ,  $(4, 0)$ , +  $(5, 0)$

*crosses touches crosses*

c.  $f(0) = -2(0-4)^2(0^2-25) = -2(16)(-25) = 800$

The  $y$ -intercept is  $(0, 800)$

d.  $f(-x) = -2(-x-4)^2((-x)^2-25) = -2(x^2+8x+16)(x^2-25)$

$$f(x) = -2(x-4)^2(x^2-25) = -2(x^2-8x+16)(x^2-25)$$

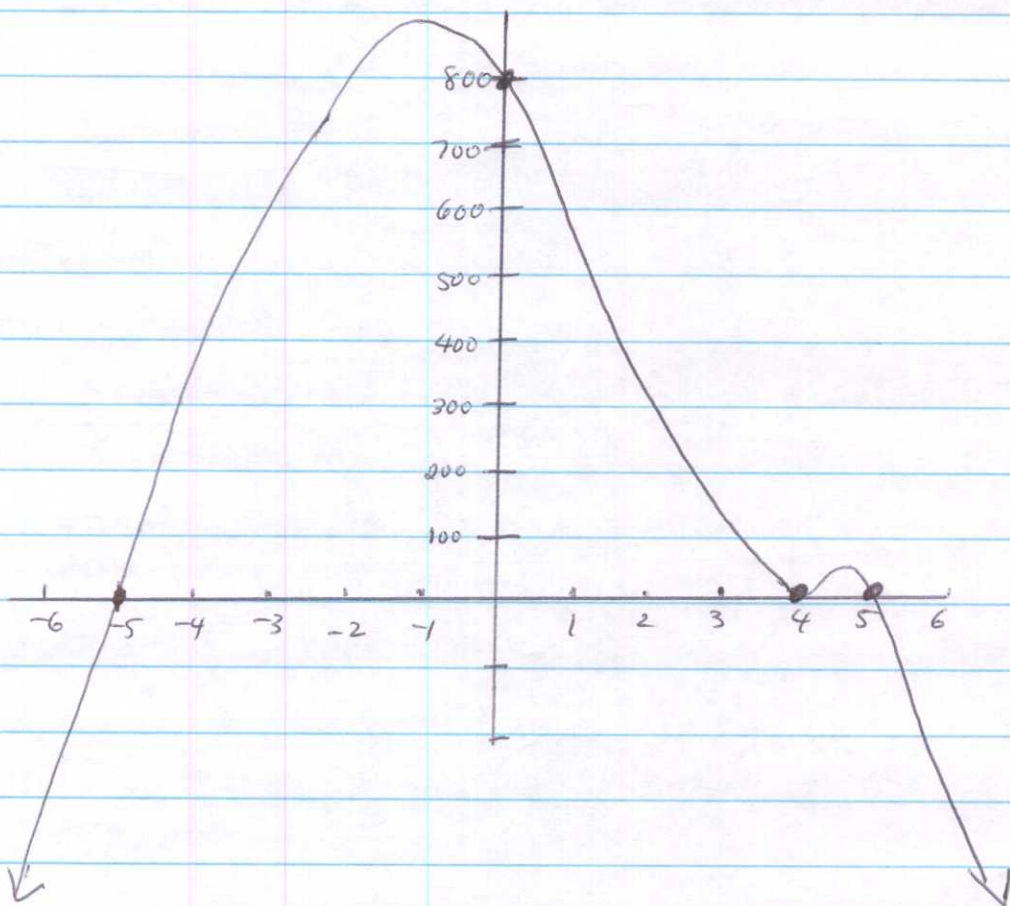
$$f(-x) \neq -f(x)$$

$$f(-x) \neq f(x)$$

The graph has neither  
 $y$ -axis nor origin symmetry

e. See next page.

Initial Sketch using Intercepts + End behavior



Fine Tune Graph using additional points  
to find relative maxima between  $-5$  &  $0$  &  
between  $4$  &  $5$  on the x-axis.

