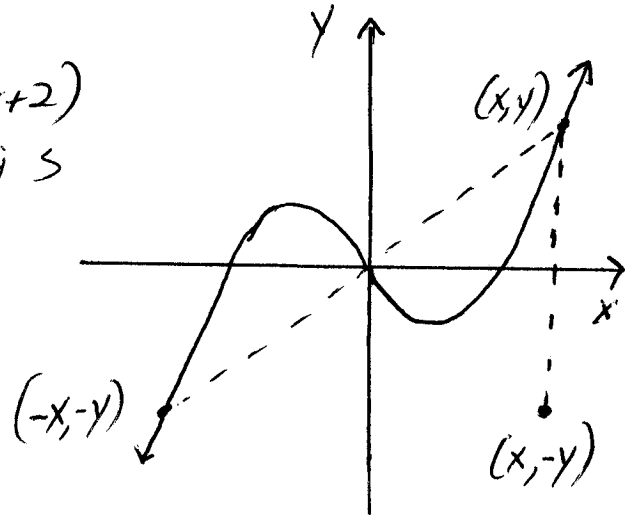
Math 12
Vogler

Symmetry Example



Ex The graph of $y = x(x-2)(x+2)$ is given. Show this graph is

a) symmetric about origin

b) NOT symmetric about the x-axis

Soln

a) Assume (x,y) is on the graph. Want to show $(-x,-y)$ is also on graph.

(Let x be $-x$ & y be $-y$ then plug into $y = x(x-2)(x+2)$)

$\Rightarrow (-y) = (-x)((-x)-2)((-x)+2)$

$\Rightarrow +y = +x(-x-2)(-x+2) \Rightarrow y = x(-1)(x+2)(-x+2)$ (distribute)

(matches original equation)

$\Rightarrow y = x(x+2)(x-2)$ TRUE

b) Assume (x,y) is on graph. Show $(x,-y)$ NOT on graph

(Let y be $-y$, then plug into $y = x(x-2)(x+2)$)

$\Rightarrow (-y) = x(x-2)(x+2)$

$\Rightarrow y = -x(x-2)(x+2)$ FALSE

(Doesn't match original equation)