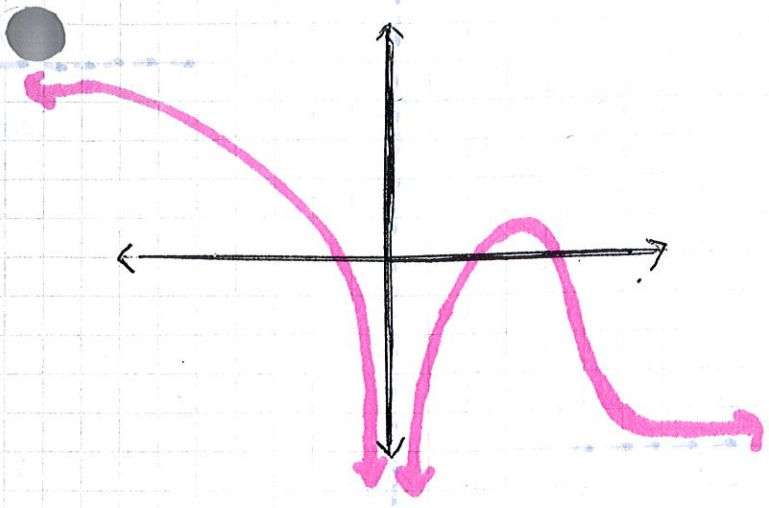
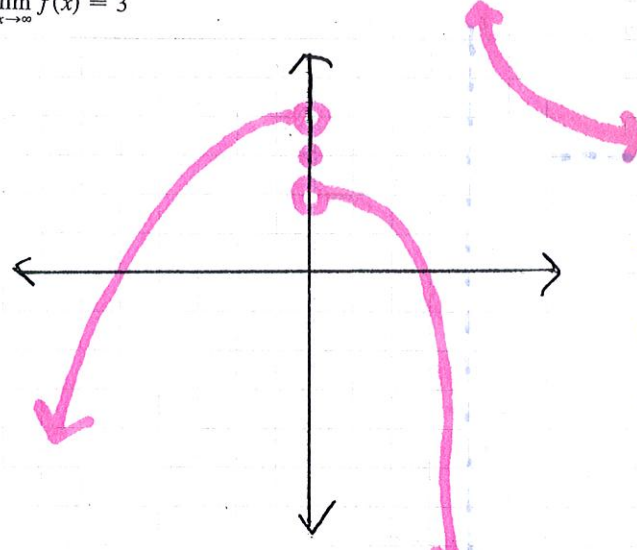


Sketch.

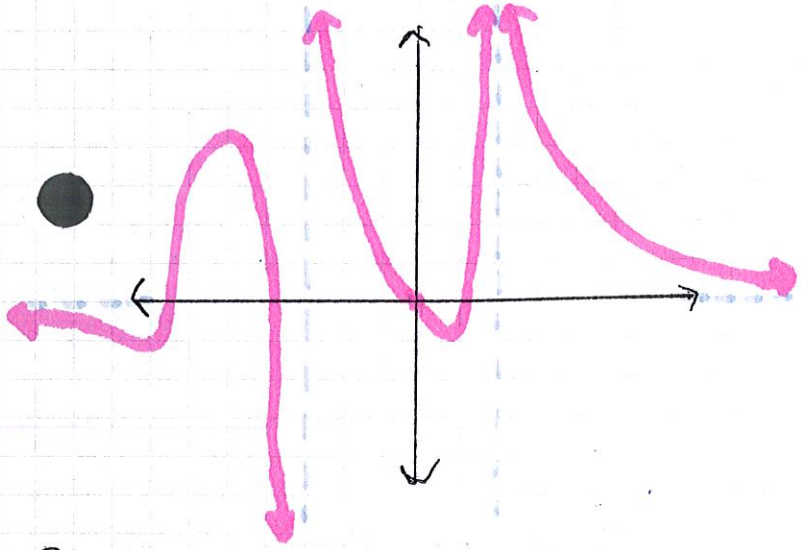
① $\lim_{x \rightarrow 0} f(x) = -\infty$, $\lim_{x \rightarrow -\infty} f(x) = 5$, $\lim_{x \rightarrow \infty} f(x) = -5$



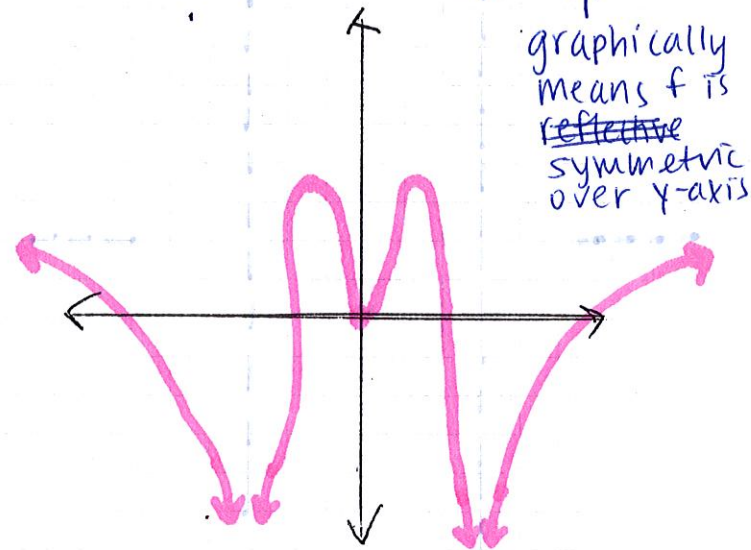
② $f(0) = 3$, $\lim_{x \rightarrow 0^-} f(x) = 4$, $\lim_{x \rightarrow 0^+} f(x) = 2$,
 $\lim_{x \rightarrow -\infty} f(x) = -\infty$, $\lim_{x \rightarrow 4^-} f(x) = -\infty$, $\lim_{x \rightarrow 4^+} f(x) = \infty$,
 $\lim_{x \rightarrow \infty} f(x) = 3$



③ $\lim_{x \rightarrow 2} f(x) = \infty$, $\lim_{x \rightarrow -2^+} f(x) = \infty$, $\lim_{x \rightarrow -2^-} f(x) = -\infty$,
 $\lim_{x \rightarrow -\infty} f(x) = 0$, $\lim_{x \rightarrow \infty} f(x) = 0$, $f(0) = 0$

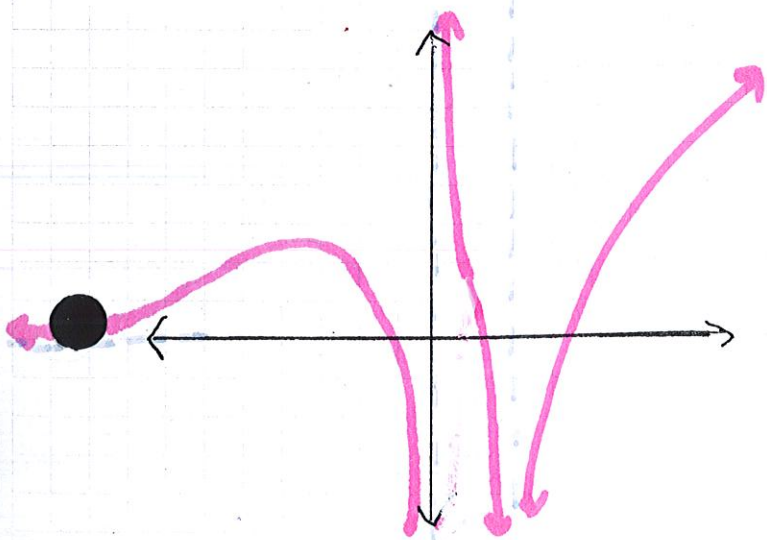


④ $\lim_{x \rightarrow 3} f(x) = -\infty$, $\lim_{x \rightarrow \infty} f(x) = 2$, $f(0) = 0$, f is even

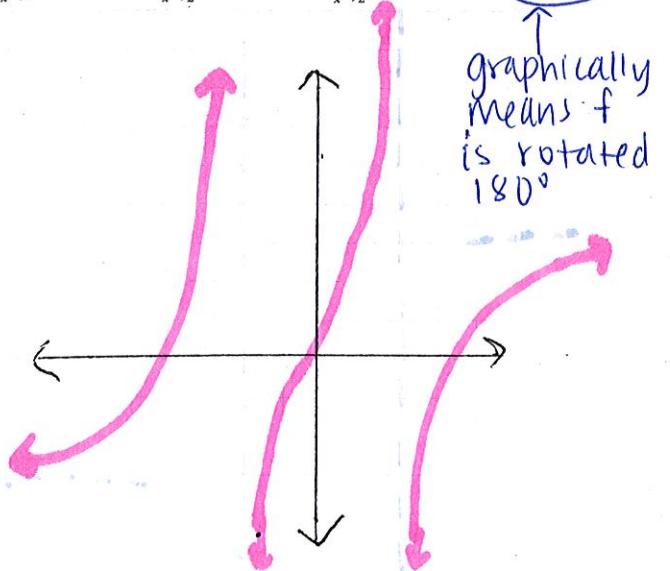


graphically means f is ~~reflective~~ symmetric over y-axis

⑤ $\lim_{x \rightarrow 2} f(x) = -\infty$, $\lim_{x \rightarrow \infty} f(x) = \infty$, $\lim_{x \rightarrow -\infty} f(x) = 0$,
 $\lim_{x \rightarrow 0^+} f(x) = \infty$, $\lim_{x \rightarrow 0^-} f(x) = -\infty$



⑥ $\lim_{x \rightarrow \infty} f(x) = 3$, $\lim_{x \rightarrow 2^-} f(x) = \infty$, $\lim_{x \rightarrow 2^+} f(x) = -\infty$, f is odd



graphically means f is rotated 180°