

## Graphing Rational Functions

1. a) How is the end behavior of an even degree polynomial different from that of an odd degree polynomial? Draw two pictures (one for even one for odd) that support your answer.

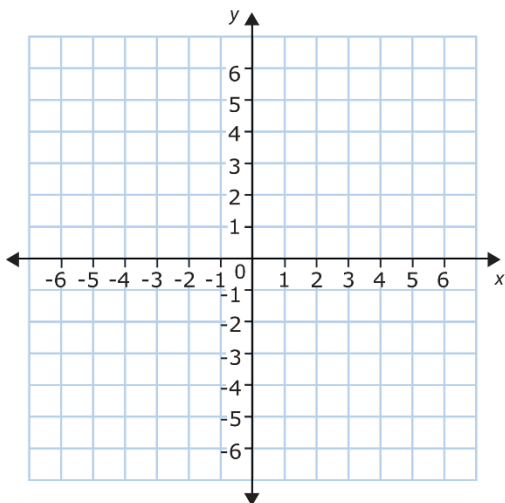
b) How does the behavior of a polynomial differ at a root with even multiplicity compared to a root with odd multiplicity? Draw two pictures that support your answer.

c) How does the behavior of a rational function differ at an asymptote that comes from a root with even multiplicity compared to one an asymptote that comes from a root with odd multiplicity? Draw two pictures that support your answer.

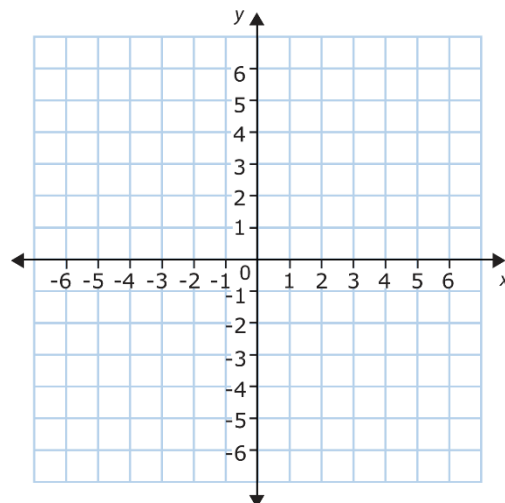
d) What do you notice in common about all of your answers and pictures regarding even exponents versus odd exponents? What is it about even and odd exponents that makes this true?

Graph each function.

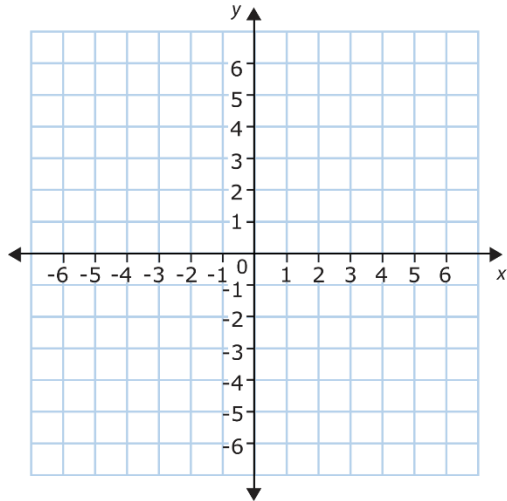
2.  $f(x) = \frac{3}{x-1}$



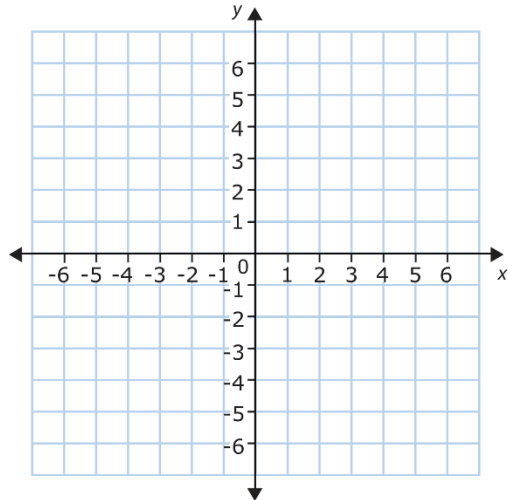
3.  $f(x) = \frac{x+1}{(x+1)(x-1)^2}$



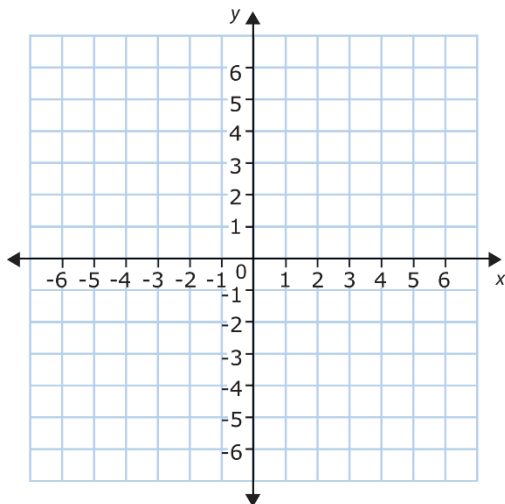
$$4. f(x) = \frac{-1}{x^2+6x+9}$$



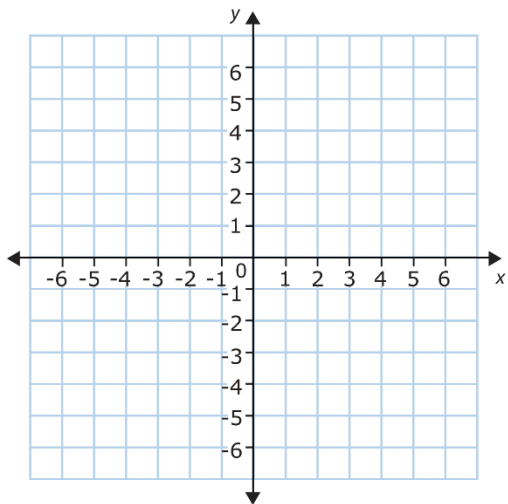
$$5. f(x) = \frac{x+2}{x^2-x-3}$$



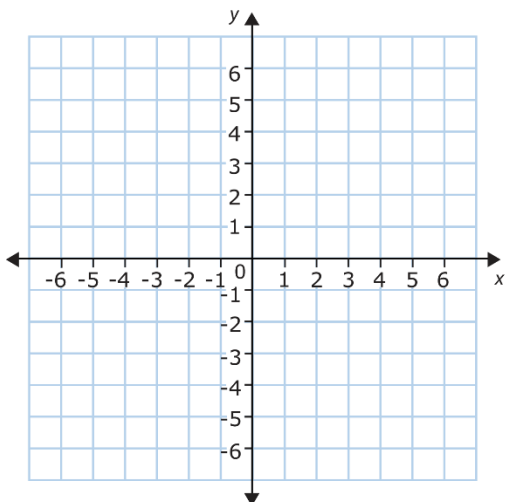
$$6. f(x) = \frac{x^3-x}{x+1}$$



$$7. f(x) = \frac{2-x}{x(x-2)}$$



$$8. f(x) = \frac{x}{x^3+4x^2+4x}$$



$$9. f(x) = \frac{-3}{2x+5}$$

