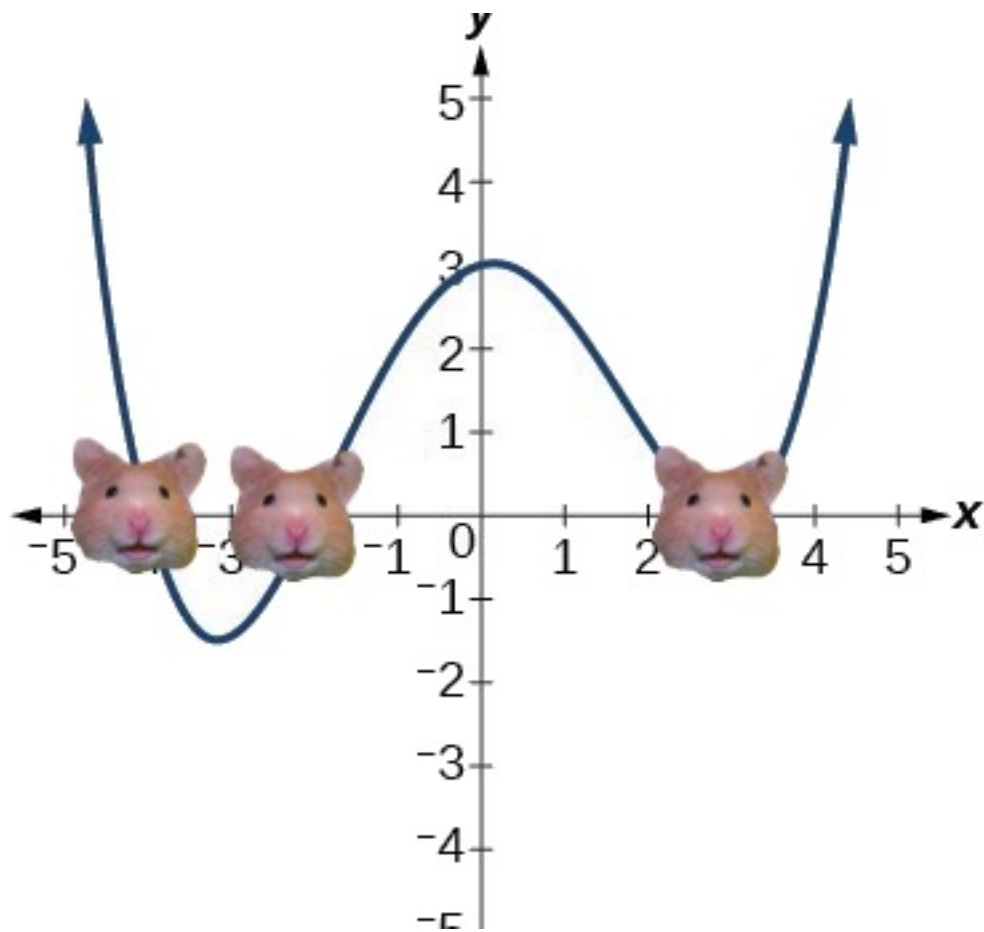


Finding Zeros of Polynomials



By the end of this lesson, I will be able to answer the following questions...

1. What are zeros of polynomials?
2. What are the techniques to find the zeros of a polynomial?
3. How do I find zeros of a polynomial using technology?
4. What is multiplicity?
5. how does multiplicity affect a polynomial graph?

Vocabulary

1. **Zeros of a polynomial** - the “x” value(s) of polynomials that make the function zero. Also, can be considered the x-intercepts of the function.
2. **Multiplicity** - when a function has multiply zeros at a single point, that will affect the graph in certain ways.
3. **Tangency** - when a two graphs intersect and exactly one point.

Prerequisite Skills with Practice

Revisiting Factoring, Zero Product Property, the Quadratic Formula and Using Square Roots

Solve the following and verify your solutions using technology

solve by factoring

$$x^2 + 9x + 20 = 0$$



solve by factoring

$$2x^2 - 17x + 35 = 0$$



solve by factoring

$$x^2 - 10x = 0$$



solve by using square roots

$$2x^2 - 9 = 0$$



solve by using square roots

$$(x - 4)^2 - 5 = 20$$

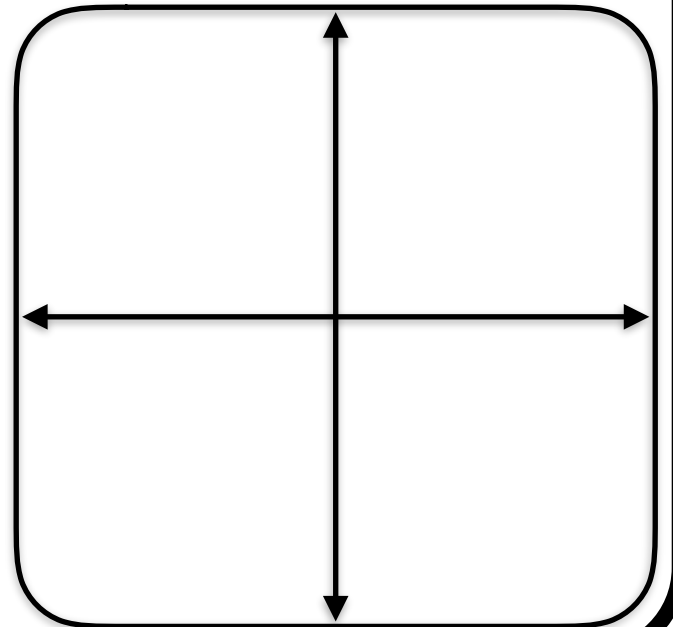
solve using the quadratic formula

$$2x^2 - 3x - 4 = 0$$



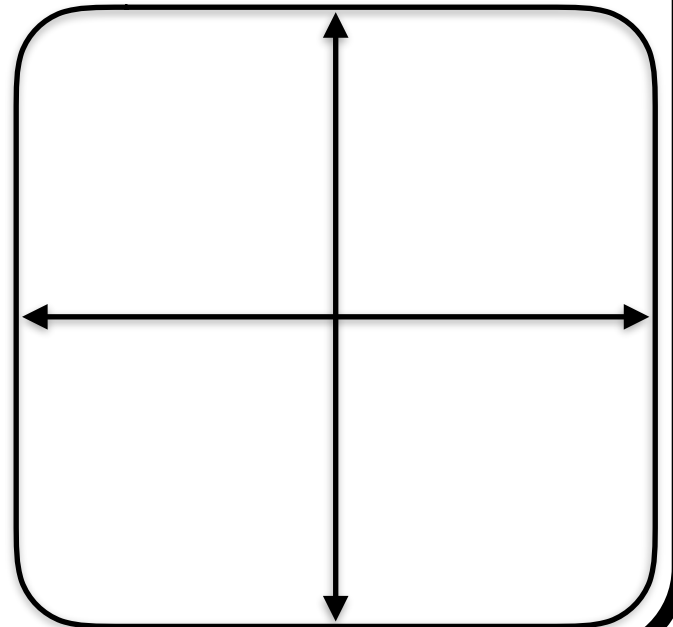
$$f(x) = x^3 + x^2 - 2x$$

- Finding zeros of a polynomial function.
- Making sketches based on end behavior and intercepts



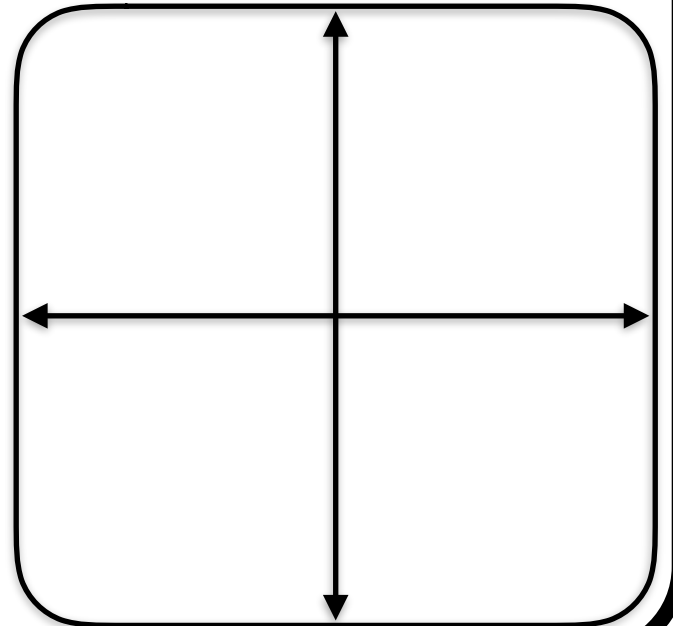
- Finding zeros of a polynomial function.
- Making sketches based on end behavior and intercepts

$$f(x) = -x^3 + 9x$$

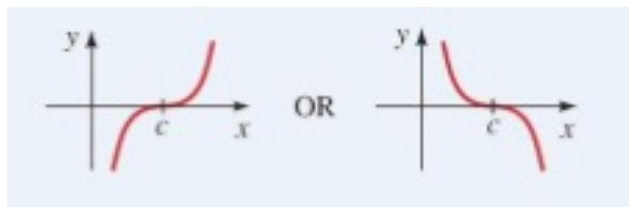


- Finding zeros of a polynomial function.
- Making sketches based on end behavior and intercepts

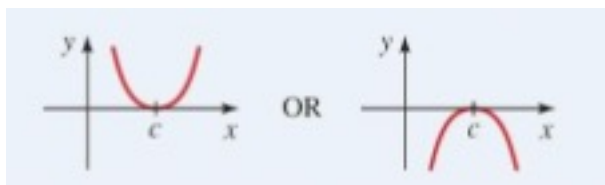
$$f(x) = x^3 - 2x^2 - 4x$$



- Finding zeros of a polynomial function.
- Introducing multiplicities....

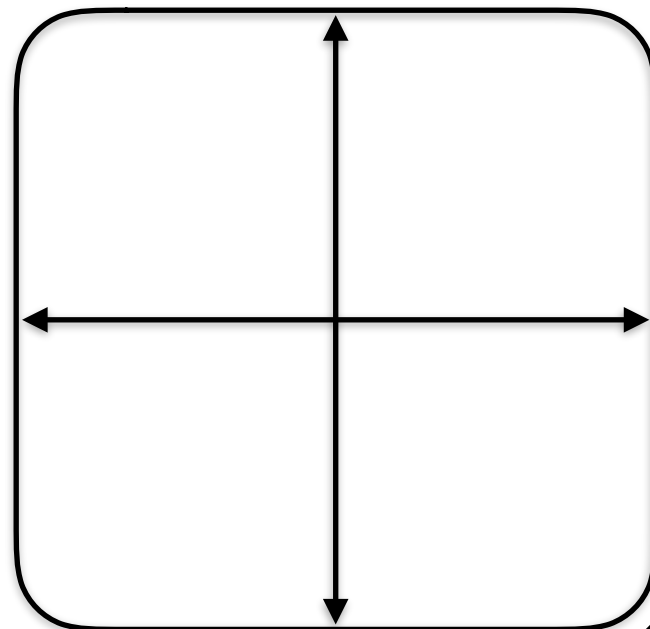


Graph behavior around x-intercept for or odd multiplicities

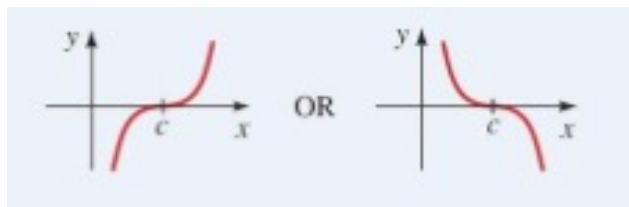


Graph behavior around x-intercept for or odd multiplicities

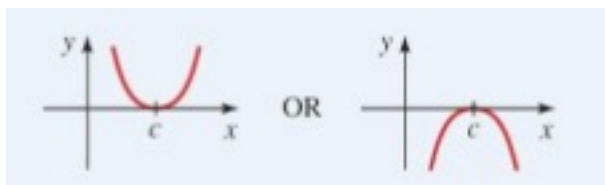
$$g(x) = 2x^4 - 2x^2$$



- Finding zeros of a polynomial function.
- Introducing multiplicities....

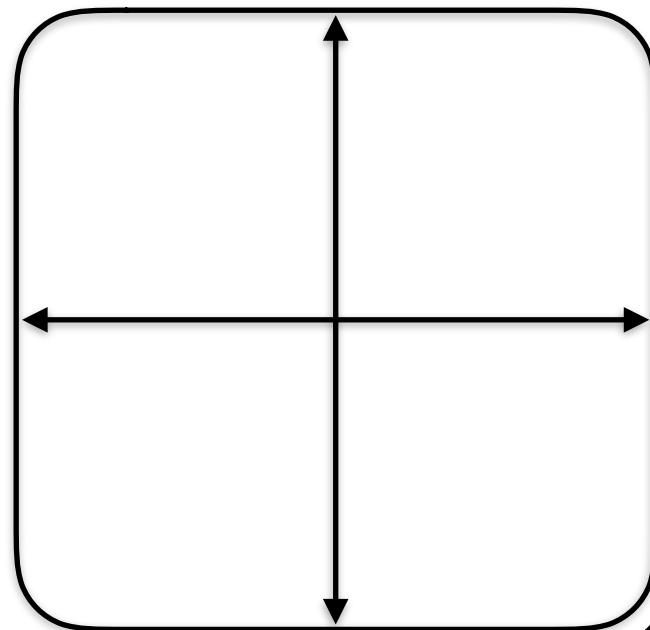


Graph behavior around x-intercept for or odd multiplicities



Graph behavior around x-intercept for or odd multiplicities

$$g(x) = 2x^5 - 5x$$



THE END



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