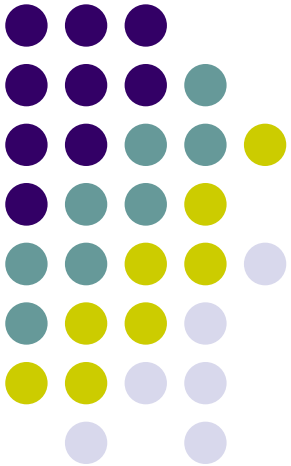
Root Functions (3)

Special Compositions of Root Functions



Outline

- Special Compositions of Root Functions

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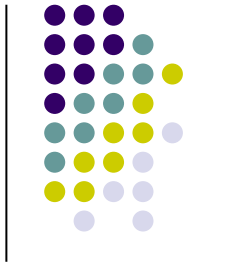
Special Compositions of Root Functions

A polynomial and a root function may be composed to yield a new function.

This type of composite functions appear frequently. Let us explore some simple but important examples.

Special Compositions of Root Functions



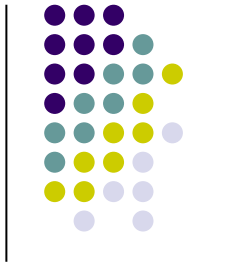
Example

Find the domain of $\sqrt{x^2}$ and investigate this function.

Example

Simplify functions $\sqrt{x^6}$ and $\sqrt{\left(f(x)\right)^2}$.

Special Compositions of Root Functions



Now we consider compositions of the square root function and other quadratic functions.

In particular, **circles** or **ellipses** are related to graphs of these composite functions.

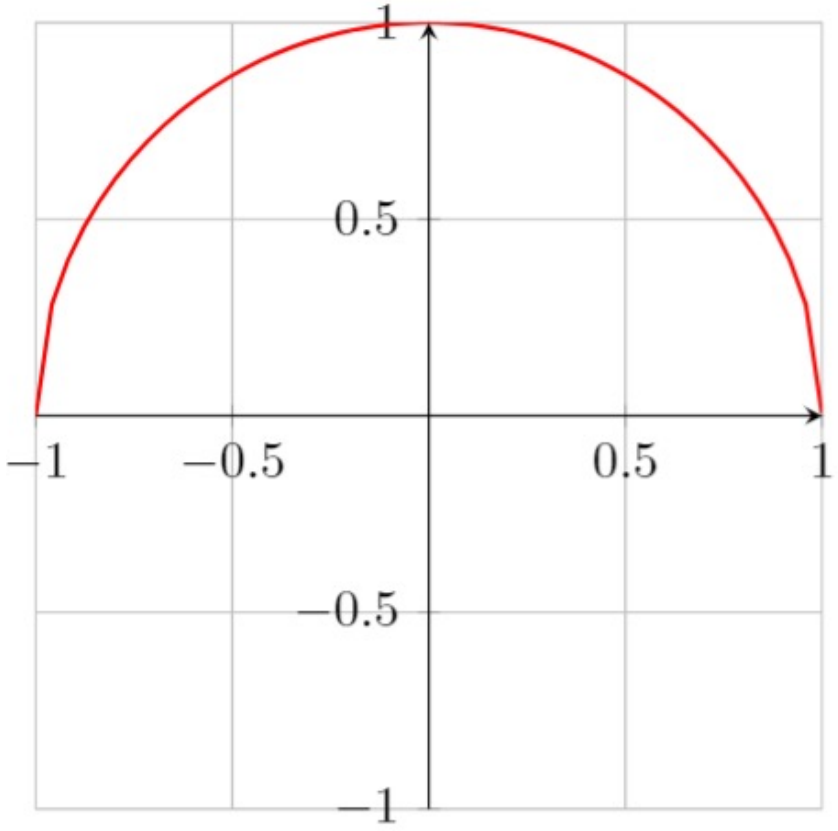
Special Compositions of Root Functions

Example

Find the domain of

$$f(x) = \sqrt{1 - x^2}$$

and sketch its graph.

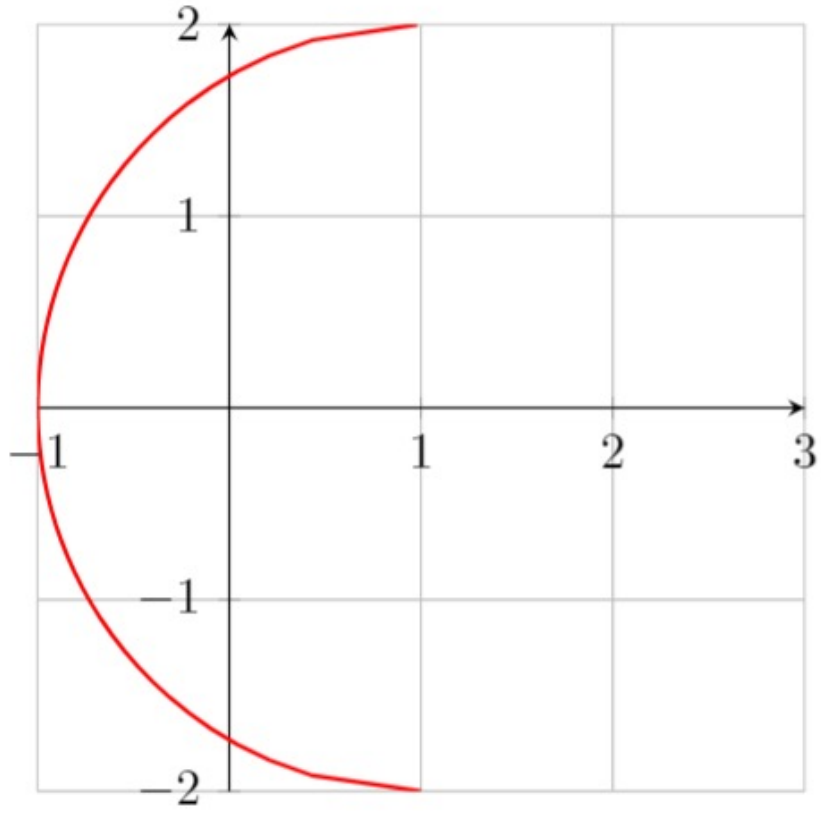


Special Compositions of Root Functions

Example

Find an equation of x, y that describes the left half part of the circle

$$(x-1)^2 + y^2 = 4.$$



Review

- How do we determine the domain of a composition of root functions?

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