Finding the Domain of Algebraic Functions*

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Abstract

Finding the domain of various algebraic functions

When finding domain consider the following:

- In rational functions, the denominator cannot equal 0
- When even-degreed roots are in the numerator, the expression under the radical must be greater than or equal to 0
- When even-degreed roots are in the denominator, the expression under the radical must be greater than 0

Exercise 1 *(Solution on p. 2.)*

$y = \sqrt{12 - x}$

Exercise 2 *(Solution on p. 2.)*

$y = x^2 + 9x - 20$

Exercise 3 *(Solution on p. 2.)*

$y = \sqrt{x^2 + 6x + 5}$

Exercise 4 *(Solution on p. 2.)*

$y = \frac{x-2}{\sqrt{x+4}}$

Exercise 5 *(Solution on p. 2.)*

$y = \frac{\sqrt{7-x}}{x}$

Exercise 6 *(Solution on p. 2.)*

$y = \frac{x-1}{\sqrt{x^2-4x}}$

Exercise 7 *(Solution on p. 2.)*

$y = \frac{\sqrt{x^2-1}}{x^2-4}$

Exercise 8 *(Solution on p. 2.)*

$y = \frac{3x-1}{\sqrt{x}+5}$

Exercise 9 *(Solution on p. 2.)*

$\frac{1}{|\sqrt{x+1}|}$

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Solutions to Exercises in this Module

Solution to Exercise (p. 1)
$(-\infty, 12]$ since $12 - x \geq 0$
Solution to Exercise (p. 1)
$(-\infty, \infty)$ since there are no even-degreed roots and it is not a rational function
Solution to Exercise (p. 1)
$(-\infty, -5] \cup [-1, \infty)$ since $x^2 + 6x + 5 \geq 0$
Solution to Exercise (p. 1)
$(-4, \infty)$ since $x + 4 > 0$
Solution to Exercise (p. 1)
$(-\infty, 0) \cup (0, 7]$ since $7 - x \geq 0$ and $x \neq 0$
Solution to Exercise (p. 1)
$(-\infty, 0) \cup (4, \infty)$ since $x^2 - 4x > 0$
Solution to Exercise (p. 1)
$(-\infty, -2) \cup (-2, -1] \cup [1, 2) \cup (2, \infty)$ since $x^2 - 1 \geq 0$ and $x^2 - 4 \neq 0$
Solution to Exercise (p. 1)
$[0, 25) \cup (25, \infty)$ since $\sqrt{x} + 5 \neq 0$ and $x \geq 0$
Solution to Exercise (p. 1)
$(-1, \infty)$ since $x + 1 > 0$