

1.4 Function Notation

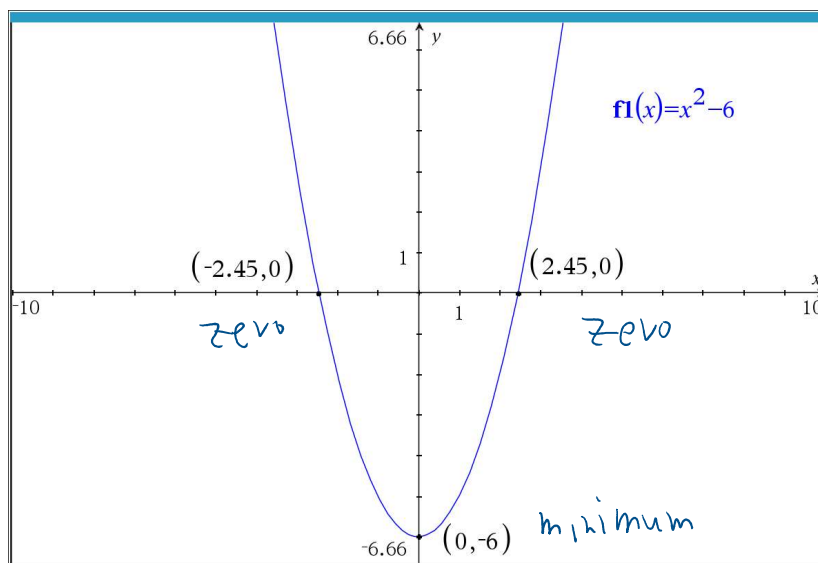
1.4.2 Exercises

page 63: 1, 4, 15, 19, 31, 35, 37, 39, 67

In Exercises 37 - 62, find the (implied) domain of the function.

$$37. f(x) = x^4 - 13x^3 + 56x^2 - 19$$

$$\text{domain} = (-\infty, \infty) = \{x \mid x \in \mathbb{R}\} = \mathbb{R}$$



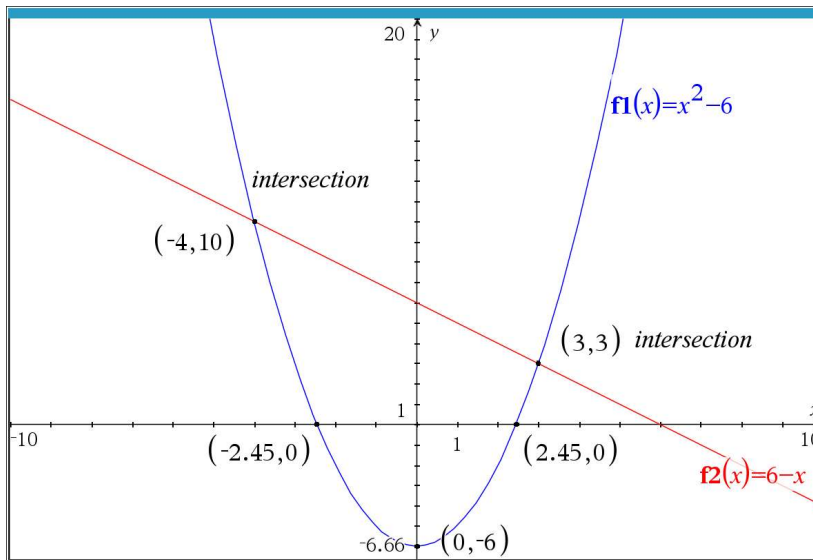
solve $x^2 - 6 = 0$
 exactly
 $x^2 - 6 + 6 = 0 + 6$
 $x^2 + (-6 + 6) = 6$
 $x^2 + 0 = 6$
 $x^2 = 6$

exact

$$x = \pm\sqrt{6}$$

$$\text{Sqrt}(6) = 2.449489742783178$$

$$2.45 \approx \sqrt{6}$$



Hey Donald! Copilot here. How's your afternoon shaping up?

Mm-hm.

Well, my afternoon's going fine. I'm in the middle of recalcus today, teaching a class, and I'd like to know, could you help me solve the equation $x^2 - 6 = 0$?

Absolutely! To solve the equation $x^2 - 6 = 0$, you'll want to add 6 to both sides, giving you $x^2 = 6$. Then, take the square root of both sides. That gives you $x = \sqrt{6}$ or $x = -\sqrt{6}$. So, x can be approximately ± 2.45 . Hope that helps!

Sure thing! On your TI-84 Plus, start by pressing the "Y=" button. Enter the equation as it is: "Y1= X^2 - 6." Next, press "GRAPH" to see where the curve crosses the X-axis. Now, hit "2ND" and then "TRACE" for the "CALC" menu. Choose "Zero" and move the cursor to the left and right of the root. Press "ENTER" for each, and it'll find the X-intercepts, which are your solutions. For this equation, you should get $X = \sqrt{6}$ and $X = -\sqrt{6}$.

not from TI-84 graph

*You should say
 $x \approx \pm 2.45$ from my graph*

64. The area A enclosed by a circle, in square meters, is a function of its radius r , when measured in meters. This relation is expressed by the formula $A(r) = \pi r^2$ for $r > 0$. Find $A(2)$ and solve $A(r) = 16\pi$. Interpret your answers to each. Why is r restricted to $r > 0$?

$$A(2) = \pi(2^2) = 4\pi$$

interpretation:

If the radius of a circle is 2, then its area is 4π .

$$\text{solve } A(r) = 16\pi$$

$$r = ?$$

~~$$\pi r^2 = 16\pi$$~~

$$r^2 = 16$$

$$r = \pm 4$$

Given $r > 0$

$$r = 4$$

Interpretation: If the area of the circle is 16π , then the radius is 4.

simplify and find the domain

1.5

$$f(x) = \frac{3x^2}{x} = 3x$$

domain =

$$\uparrow 3/0 = 0$$

$$\frac{3 \cdot 0^2}{0} = \frac{0}{0} \text{ not defined}$$

when we simplify functions,
we may change the domain

