



Functions and Applications

Chapter 1: Introduction to the Quadratic Function

1.7 Domain and Range of a Quadratic Function

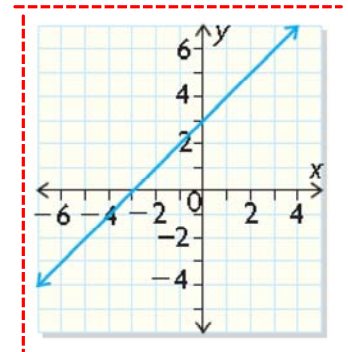


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1.7 Domain and Range of a Quadratic Function

What is the domain and range of the given function (blue line)
 $f(x) = x+3$



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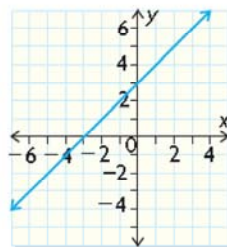
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1.7 Domain and Range of a Quadratic Function

A linear function has the following domain and range:

$$D: \{x \in R\}$$

$$R: \{y \in R\}$$

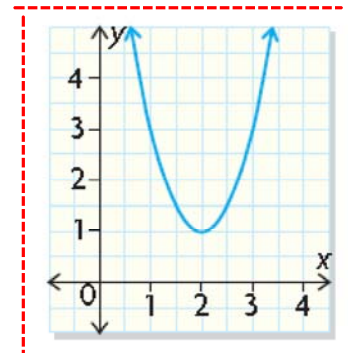


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1.7 Domain and Range of a Quadratic Function

What is the domain and range of the given function (blue line)
 $f(x) = (x-3)^2+1$



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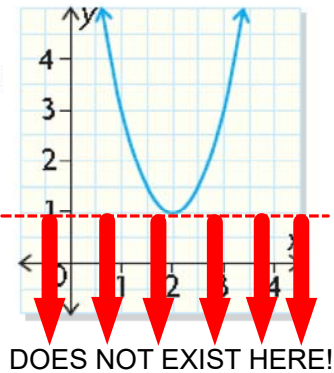
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1.7 Domain and Range of a Quadratic Function

A quadratic also has unlimited domain, however, there are limits to its range.

$$D: \{x \in \mathbb{R}\}$$

$$R: \{y \in \mathbb{R} \mid y \geq 1\}$$



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A flare is shot vertically upward. A motion sensor records its height above ground every 0.2 s. The results are shown in the table.

Time (s)	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
Height (m)	0.0	1.8	3.2	4.2	4.8	5.0	4.8	4.2	3.2	1.8	0.0

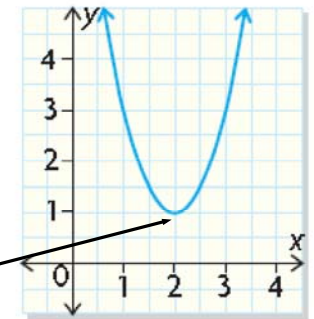
State the domain and range of the function represented by the table:

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To accurately describe the range of a quadratic function it is important to locate the Vertex, and then determine where the function with respect to that point.



Vertex (2, 1)
Minimum! $y \geq 1$

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Find the domain and range of $y = 3(x - 2)^2 + 3$.



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1.7 Domain and Range of a Quadratic Function

Find the domain and range of each linear function.

a) $f(x) = -3x + 4$ b) $y = 5$



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A baseball thrown from the top of a building falls to the ground below. The path of the ball is modelled by the function $h(t) = -5t^2 + 5t + 30$, where $h(t)$ is the height of the ball above ground, in metres, and t is the elapsed time in seconds. What are the domain and range of this function?



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Homework:

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