

Warm Up

Determine the Domain and Range:

a) $y = 3x + 4$ b) $y = -3(x - 2)^2 + 4$ c) $y = 2(x - 3)^3 + 5$

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

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$R = \{y \in \mathbb{R}\}$

$R = \{y \in \mathbb{R} \mid y \leq 4\}$

$R = \{y \in \mathbb{R}\}$



Domain and Range Part 3

Lesson objectives

- I know how to find the domain and range of a circle
- I know how to find the domain and range of an absolute value function
- I know how to find the domain and range of a root function

1.1

Lesson objectives

Teachers' notes

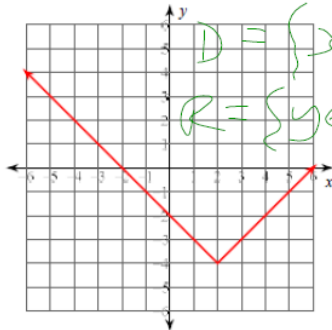
Lesson notes

Homework - Complete domain and range for the handout

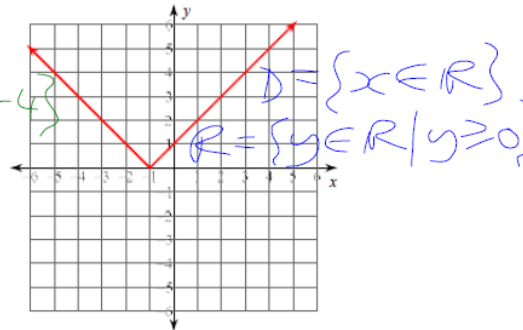
Domain and Range - The Absolute Value Function

Examples 1 & 2 from the Absolute Value Graphs Handout
Determine the domain and range.

1) $y = |x - 2| - 4$



2) $y = |x + 1|$



Is there anything that will change our domain and range for an absolute value function?

No change on domain $D = \{x \in \mathbb{R}\}$
Range affected by "a" and "c" [same as for a quadratic]

Domain and Range - The Absolute Value Function



For an absolute value function the domain is never restricted.

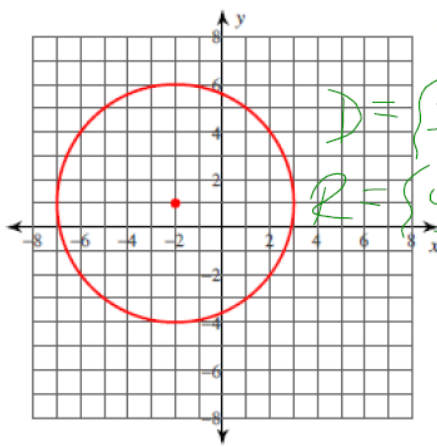
The range is dependent on the "vertex" and direction of opening.

It behaves in the same way as a parabola.



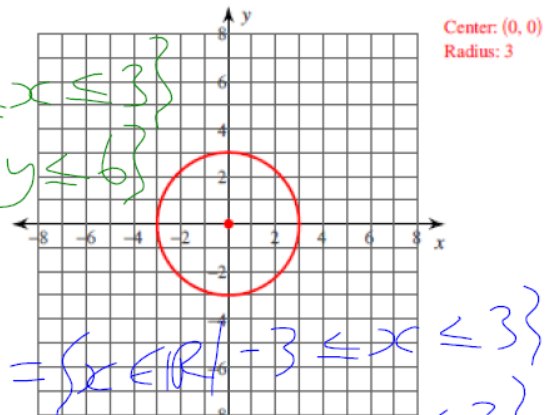
Domain and Range - The Circle

Examples from the Circle Graphs Handout
Determine the domain and range.



$$D = \{x \in \mathbb{R} \mid -7 \leq x \leq 3\}$$

$$R = \{y \in \mathbb{R} \mid -4 \leq y \leq 6\}$$



$$D = \{x \in \mathbb{R} \mid -3 \leq x \leq 3\}$$

$$R = \{y \in \mathbb{R} \mid -3 \leq y \leq 3\}$$

What affects the domain and range of a circle?

Domain and Range - The Circle

The domain and the range of a circle have a **lower and upper value**.

To determine the values, we need to determine the **centre** and the **radius**.

The centre is the **point (d,c)**.

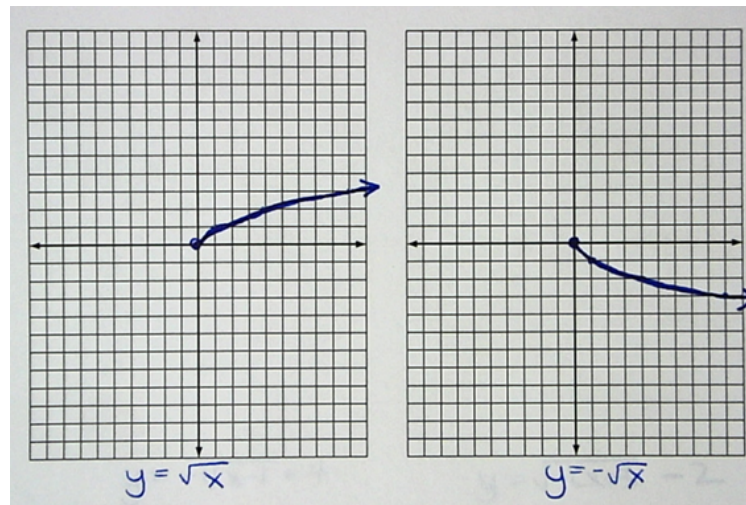
The restrictions on the domain are "**d**" \pm the **radius**.

The restrictions on the range are "**c**" \pm the **radius**.



Domain and Range - The Root Function

Examples 1 & 2 from the Root Functions Graphs Handout
Determine the domain and range.



Is there anything that will change our domain and range for a root function?

Domain and Range - The Root Function



The **domain** of a root function is **restricted by the horizontal shift** (d value) and the **sign of k**.

The **range** is **restricted by the direction of opening** (sign of a) and **the vertical shift** (c value).

$$y = a\sqrt{k(x - d)} + c$$

a is positive/negative \longrightarrow opens **up/down**

k is positive/negative \longrightarrow opens **right/left**

Root starts from the **"vertex"** (d,c).

