Domain and Range Part 1

Homework - Find the Domain & Range for the remaining graphs

Nov 4-10:28 AM

Warm Up
Simplify the following:

$$3\sqrt{28} - 2\sqrt{50} + \sqrt{63} - 3\sqrt{18} \qquad (3\sqrt{5} + 2\sqrt{10})(-2\sqrt{5} + 5\sqrt{10})$$

$3\sqrt{4 \times 7} - 2\sqrt{25 \times 2} + \sqrt{9 \times 7} - 3\sqrt{9 \times 2}$

$3\sqrt{4}\sqrt{7} - 2\sqrt{25}\sqrt{2} + \sqrt{9}\sqrt{7} - 3\sqrt{9}\sqrt{2}$

$3(2)\sqrt{7} - 2(5)\sqrt{2} + 3\sqrt{7} - 3(3)\sqrt{2}$

$6\sqrt{7} - 10\sqrt{2} \qquad\qquad - 9\sqrt{2}$

$= 9\sqrt{7} - 19\sqrt{2}$

	$3\sqrt{5}$	$2\sqrt{10}$
$-2\sqrt{5}$	$-6\sqrt{25}$	$-4\sqrt{50}$
$5\sqrt{10}$	$15\sqrt{50}$	$10\sqrt{100}$

$-6\sqrt{25} - 4\sqrt{50} + 15\sqrt{50} + 10\sqrt{100}$

$-6(5) + 11\sqrt{50} + 10(10)$

$-30 + 11\sqrt{25}\sqrt{2} + 100$

$70 + 55\sqrt{2}$

Mar 19-7:45 AM

Domain and Range

Domain: The set of all values of the independent variable (x) of a relation.

Range: The set of all values of the dependent variable (y) of a relation.

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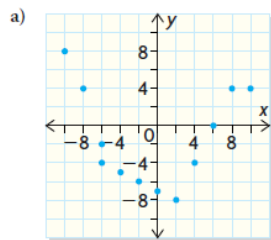When we are looking to describe the domain we are looking how far left and right a relation stretches on a graph.

If the graph is not a continuous line or curve, we look for the specific values that are used from the x-axis.

When we are looking to describe the range we are looking how far up and down a relation stretches on a graph.

If the graph is not a continuous line or curve, we look for the specific values that are used from the y-axis.
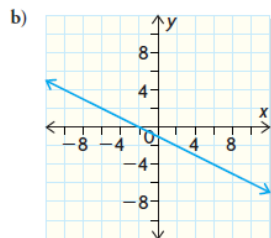
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Example
Determine the domain and range.
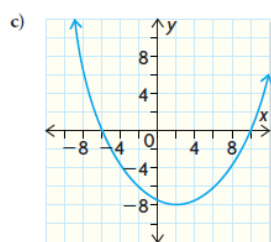
a)

$$D = \{-10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10\}$$

$$R = \{-8, -7, -6, -5, -4, -2, 0, 4, 8\}$$

b)

$$D = \{x \in R\} \quad \text{x is an element of the real numbers}$$
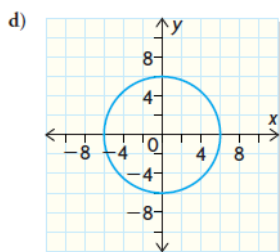
$$R = \{y \in R\}$$

c)

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

$$R = \{y \in R \mid y \geq -8\}$$

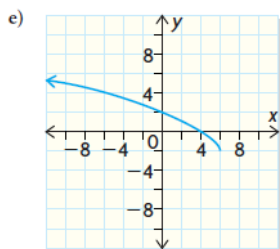y is an element of the real numbers such that y is greater than or equal to -8

Jan 21-13:24

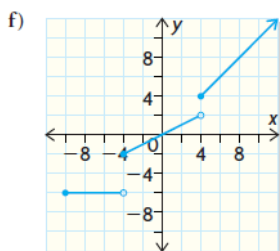## Example
Determine the domain and range.

d)

$$D = \{x \in R \mid -6 \leq x \leq 6\}$$

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

e)

$$D = \{x \in R \mid x \leq 6\}$$

$$R = \{y \in R \mid y \geq -2\}$$

f)

$$D = \{x \in R \mid x \geq -10\}$$

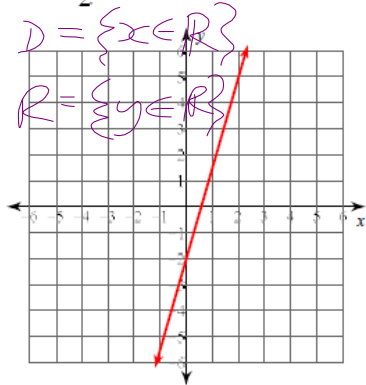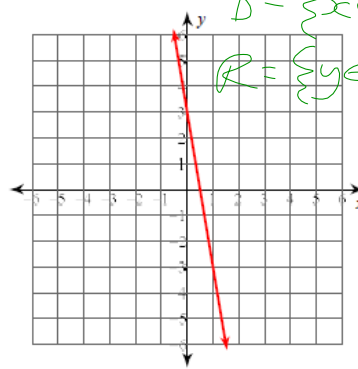$$R = \{y \in R \mid -6, -2 \leq y < 2, y \geq 4\}$$

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Domain and Range - The Line

Examples 1 and 2 from the Line Graphs Handout
Determine the domain and range.

1) $y = \frac{7}{2}x - 2$

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

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

2) $y = -6x + 3$

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

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

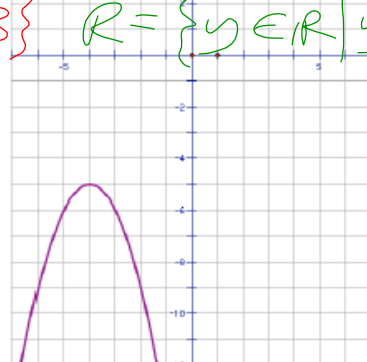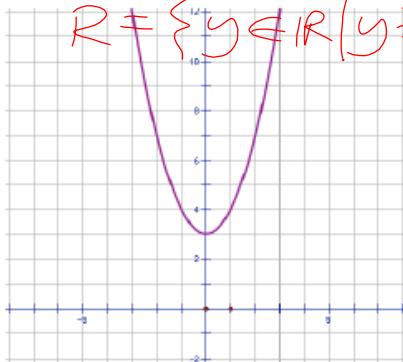Is there anything that will change our domain and range for a line?　No! Will always be $\in R$

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Domain and Range - The Parabola

Examples 33 and 34 from the Parabola Graphs Handout
Determine the domain and range.

33. $f(x) =$ $D = \{x \in R\}$

$R = \{y \in R | y \geq 3\}$

34. $f(x) =$ $D = \{x \in R\}$

$R = \{y \in R | y \leq -5\}$

What affects the domain and range of a parabola?

Domain $\rightarrow$ Nothing

Range $\rightarrow$ Vertex (y-value) and the direction of opening
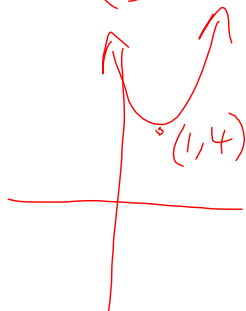
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Domain and Range - The Parabola

Determine the domain and range of the following parabolas:
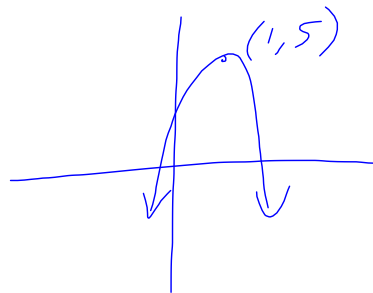
a) $y = 2(x-1)^2 + 4$ b) $y = -3(x-1)^2 + 5$

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

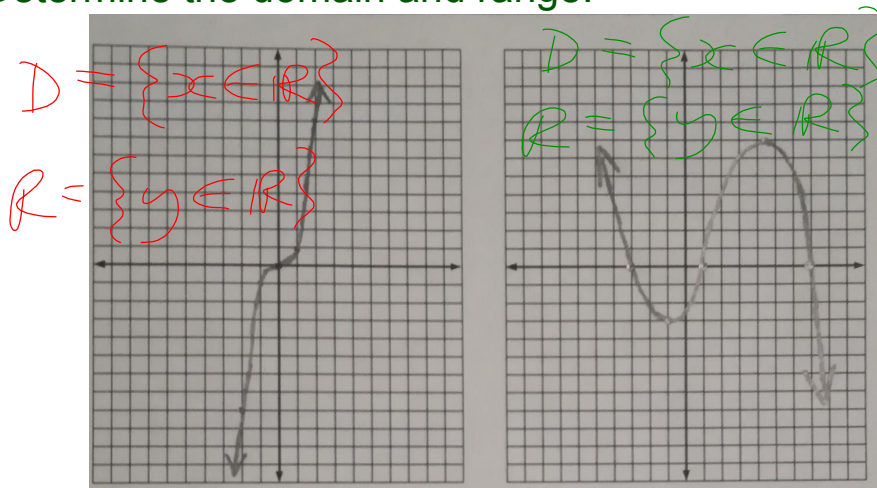$R = \{y \in R \mid y \geq 4\}$

(1,4)

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

$R = \{y \in R \mid y \leq 5\}$

(1,5)

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Domain and Range - The Cubic

Examples 1 and 2 from the Cubic Graphs Handout
Determine the domain and range.

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

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

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

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

Is there anything that will change our domain and range for a cubic?   Nope.

Jan 21-15:57

Homework

Complete the domain and range for each of the handouts given!

Mar 19-7:45 AM