The Domain & Range of a Quadratic Function

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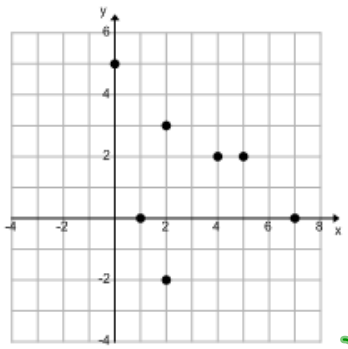
NOTE: When the graph shows points (scatter plots), the D and R will be specific values.
When the graph shows a continuous line/curve, the D and R will be interval notation.
When the graph is a line (non-vertical or non-horizontal) D and R are all real numbers.

Ex. 1: State the Domain and Range for each of the following.

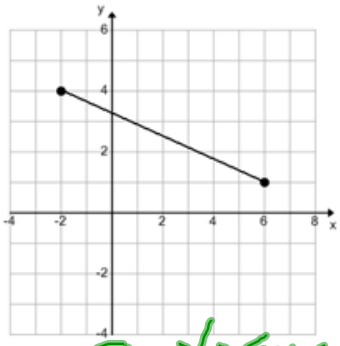
a`



Domain $\{0,1,2,4,5,7\}$

Range $\{-2,0,2,3,5\}$

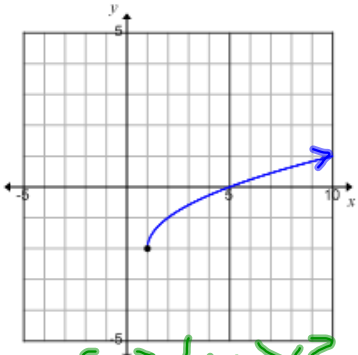
b)



Domain $\{x\in\mathbb{R} \mid -2\le x\le 6\}$

Range $\{y\in\mathbb{R} \mid 1\le y\le 4\}$

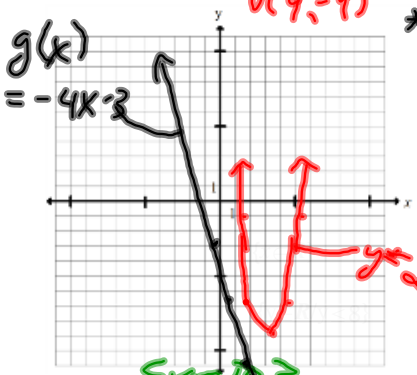
c)



Domain $\{x\in\mathbb{R} \mid x\ge 1\}$

Range $\{y\in\mathbb{R} \mid y\ge -2\}$

e) $y=2(x-4)^2-9$ $v(4,-9)$



$g(x) = -4x-3$

$y=2(x-4)^2-9$

Domain $\{x\in\mathbb{R}\}$

Range $\{y\in\mathbb{R} \mid y\ge -9\}$

f) $g(x)=-4x-3$

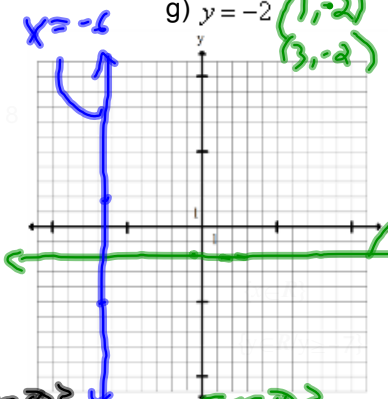
$* \; b=-3$

$m=-4$

Domain $\{x\in\mathbb{R}\}$

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

g) $y=-2$ $(1,-2)$ $(3,-2)$



$x=-6$

$y=-2$

Domain $\{x\in\mathbb{R}\}$

Range $\{-2\}$

h) $x=-6$ $(-6,2)$ $(-6,-5)$

Domain $\{-6\}$

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

$f(x)$ is linear

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

3. $y = -5t^2 + 40t - 87$

$= -5(t^2 - 8t) - 87$

$= -5(t^2 - 8t + 16 - 16) - 87$

$= -5[(t-4)^2 - 16] - 87$

$= -5(t-4)^2 - 5(-16) - 87$

$= -5(t-4)^2 + 80 - 87$

$= -5(t-4)^2 - 7$

$\therefore$ vertex $(4, -7)$

* opens down

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

$R = \{y \in \mathbb{R} \mid y \leq -7\}$

$(t-4)^2$

$= t^2 - 8t + 16$

$x^2 - 18x + 81$

$(x-9)^2$