7.1 Domain & Range

Signed progress report due Friday!!!

Warm-Up Monday

How would you describe the location of the school WITHOUT using its address?

About Me

1. What do you lose most often?
2. Chocolate or vanilla?

7.1 Domain & Range

EQ: How do I find the domain of a function?

Function:

A relation in which the independent value does not repeat (x)

How do you know if an equation is a function?

- no repeating x's
- graph passes the vertical line test

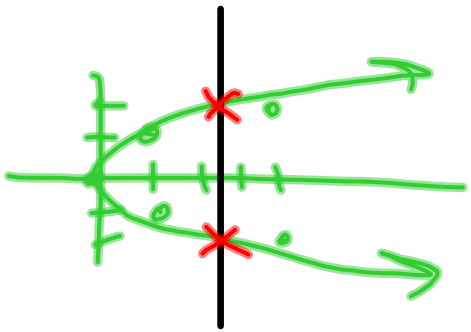
7.1 Domain & Range

EQ: How do I find the domain of a function?

Show that $\sqrt{x} = \sqrt{y^2}$ is not a function.

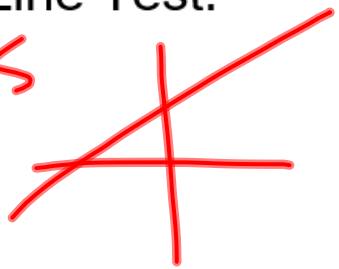
$\pm\sqrt{x} = y$

x	1	4		
y	1, -1	2, -2		



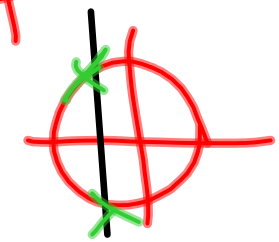
Vertical Line Test:

PASS



PASS

NOT

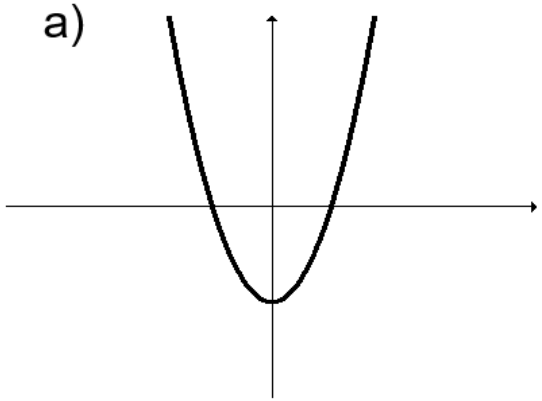


7.1 Domain & Range

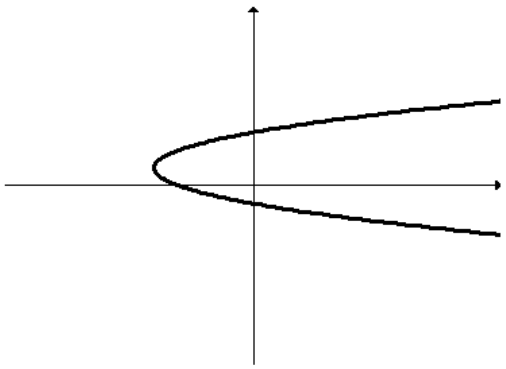
EQ: How do I find the domain of a function?

Example 1: Determine whether the following graphs represent functions:

a)



b)



7.1 Domain & Range

EQ: How do I find the domain of a function?

Domain:

All possible x-values

Range:

All possible y-values

7.1 Domain & Range

EQ: How do I find the domain of a function?

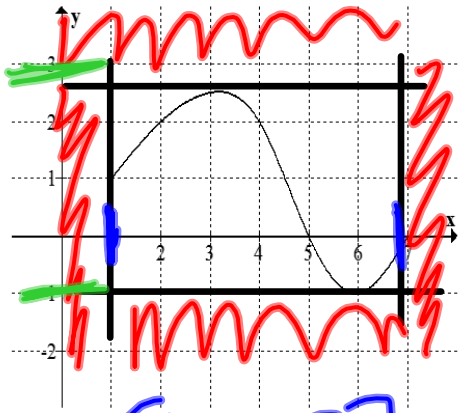
DR DILIR ROBOT
x y

( ) ← not equal ∞ ∘ (open circle)
[ ] ← equal to • (closed circle)

Find the domain & range of each function. Use interval notation.

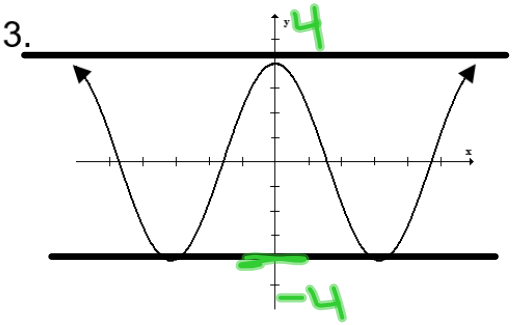
Draw a box

2.



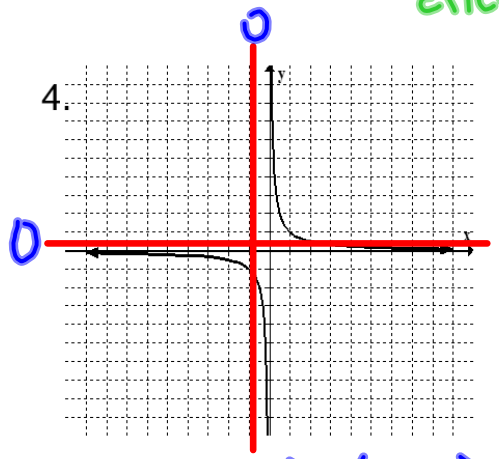
Domain: [1 , 7]
Range: [-1 , 2.5]

3.



Domain: (-∞, ∞)
Range: [-4, 4]

4.



Domain: (-∞, 0)∪(0,∞)
Range: (-∞, 0)∪(0,∞)

7.1 Domain & Range

EQ: How do I find the domain of a function?

$y=x$
$y=x^2$
$y=|x|$
$y=x^3$
$y=\sqrt[3]{x}$

Domain

$(-\infty, \infty)$

All real #s / $\mathbb{R}$

~~Rational:~~ denom. $\neq 0$

$y=\frac{1}{x}$ (x in denominator)

~~square root:~~ under radical ≥ 0

$y=\sqrt{x}$ (no negative #s under $\sqrt{\ }$)

7.1 Domain & Range

EQ: How do I find the domain of a function?

Example 5: Find the domain for each of the following functions:

a) $f(x) = x^2 - 3x + 5$

Quadratic

$(-\infty, \infty)$

b) $f(x) = \sqrt{x+3}$

$-3 + 3$

$\sqrt{0}$

$x + 3 \geq 0$

$x \geq -3$

$[-3, \infty)$

c) $f(x) = \dfrac{2x^2}{5-x}$ $(-\infty, 5) \cup (5, \infty)$

Rational

Set denom $= 0$

$5 - x \neq 0$

$+x \neq +5$

d) $f(x) = \dfrac{7-x}{\sqrt{2x-1}}$

$\cdot$ denom $\neq 0$

$\cdot \sqrt{\ } \geq 0$

$2x - 1 > 0$

$+1 \quad +1$

$\frac{2x}{2} > \frac{1}{2}$

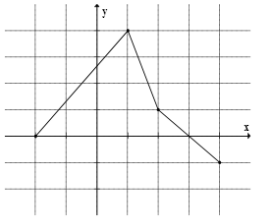
$x > \frac{1}{2}$

$\boxed{\left(\frac{1}{2}, \infty\right)}$

7.1 – Functions, Domain and Range Name _____

Determine the domain and range for each graph. Put all answers in interval notation.

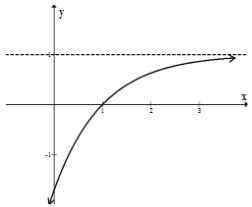
1.



Domain: _____

Range: _____

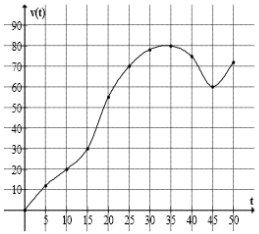
2.



Domain: _____

Range: _____

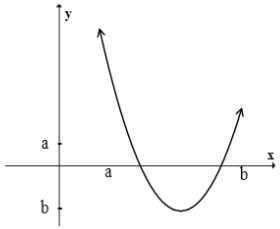
3.



Domain: _____

Range: _____

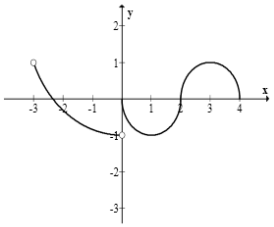
4.



Domain: _____

Range: _____

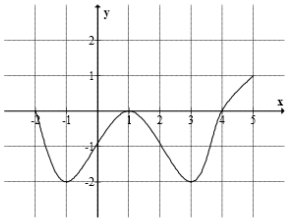
5.



Domain: _____

Range: _____

6

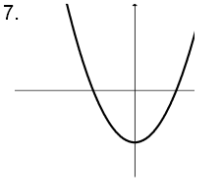


Domain: _____

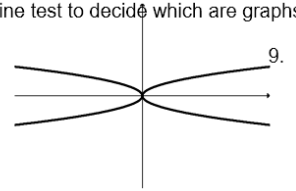
Range: _____

In questions 7-12, use the vertical line test to decide which are graphs of functions of x.

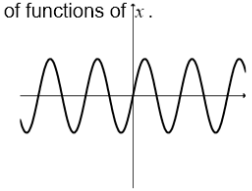
7.



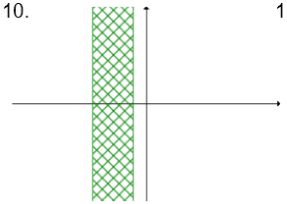
8.



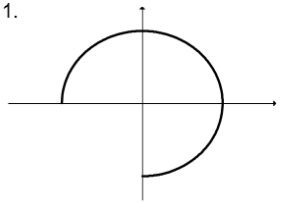
9.



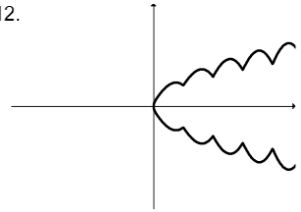
10.



11.



12.



Determine the domain for each function:

13. $f(x)=\frac{1}{3}x^3+5x^2+24$

14. $f(x)=\sqrt{x}$

15. $f(x)=\frac{1}{\sqrt{2x+1}}$

16. $f(x)=\frac{x^3+1}{2x}$

17. $x=4$

18. $f(x)=\sqrt{1-x^2}$

19. $f(x)=\sqrt{x}$

20. $f(x)=\frac{2}{(x-3)}$

21. $f(x)=x^2-3$

22. $h(x)=\sqrt{\frac{1}{x+1}}=\frac{1}{\sqrt{x+1}}$

23. $f(x)=x^2-5x-10$

24. $f(x)=\sqrt{8-x}$