

1.2 Functions and Their Properties

Domain, Range, & Continuity of Functions

Target 1B: Analyze functions using specific properties

Review of Prior Concepts

Is the formula a function? (Graph them to complete the vertical line test).

1. $y = x^2$

2. $y^2 = x$



3. $y = \sqrt{x}$

4. $x^2 + y^2 = 4$

More Practice

Is it a Function?

<http://www.mathwarehouse.com/algebra/relation/vertical-line-test.php>

<https://www.youtube.com/watch?v=zT69oxcMhPw>

<https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/cc-8th-function-intro/e/recog-func-2>

SAT Connection

Passport to Advanced Math

13. Use function notation, and interpret statements using function notation.

Example:

$$g(x) = ax^2 + 24$$

For the function g defined above, a is a constant and $g(4) = 8$. What is the value of $g(-4)$?

A) 8

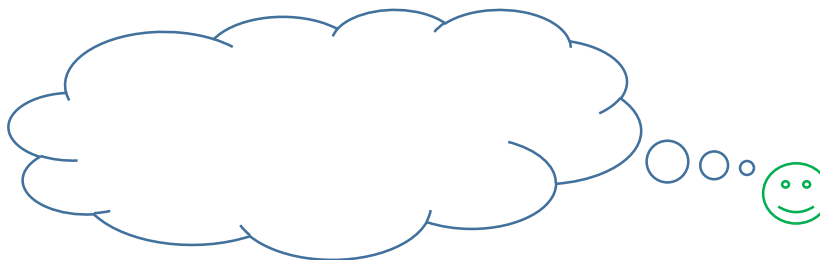
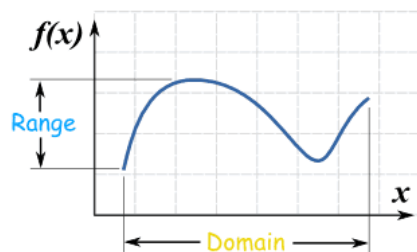
B) 0

C) -1

D) -8

[Solution](#)

Domain & Range



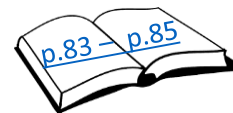
Find the domain algebraically & the range graphically of each function.

Example 1:

$$f(x) = \frac{2}{x^2 - 3x - 4}$$

Domain

Range



Example 2:

$$g(x) = \frac{\sqrt{x-3}}{x^2 - 3x - 4}$$

Domain

Range

Example 3:

$$h(x) = \frac{x^2}{x^2 - 3x}$$

Domain

Range

More Practice

Domain & Range

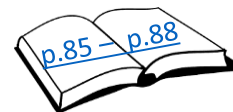
<http://www.coolmath.com/algebra/15-functions/06-finding-the-domain-01>

<https://www.khanacademy.org/math/algebra/algebra-functions/domain-and-range/v/domain-of-a-function-intro>

<http://www.intmath.com/functions-and-graphs/2a-domain-and-range.php>

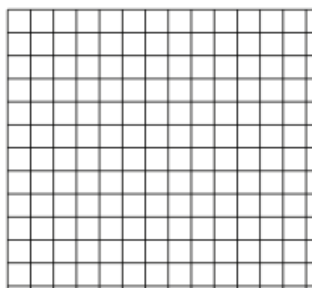
Continuity & Discontinuity

- Functions are continuous if _____
- Removable discontinuity
- Non-removable discontinuity
 -
 -

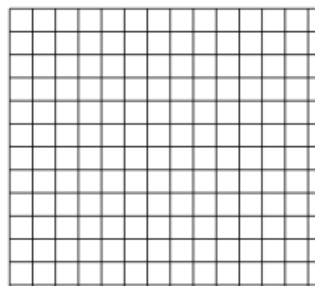


Graph the function. Identify any points of discontinuity and describe the type of discontinuity.

Example 4: $f(x) = \frac{x^2}{x^2 - 3x}$



Example 5: $g(x) = \frac{x^2 - 9}{x + 3}$



More Practice

Continuity

<http://www.ck12.org/Analysis/Discrete-and-Continuous-Functions/lesson/Continuity-and-Discontinuity-PCALC/>

<https://www.youtube.com/watch?v=2n5VzMFJQVY>

Homework Assignment

p.98 #1,3,13,14,15,18,19

SAT Connection**Solution**

Choice A is correct. Since g is an even function, $g(-4) = g(4) = 8$.

Alternatively: First find the value of a , and then find $g(-4)$. Since $g(4) = 8$, substituting 4 for x and 8 for $g(x)$ gives $8 = a(4)^2 + 24 = 16a + 24$. Solving this last equation gives $a = -1$. Thus $g(x) = -x^2 + 24$, from which it follows that $g(-4) = -(-4)^2 + 24$; $g(-4) = -16 + 24$; and $g(-4) = 8$.

Choices B, C, and D are incorrect because g is a function and there can only be one value of $g(-4)$.