

July 9, 2015

9.2
1-4, 6, 8, 10, 11, 15, 17, 18, 21, 22, 23, 26, 27, 28, 29, 32, 33, 35

9.3
1-8, 43-47

9.4
5, 6, 7, 8, 10, 13, 20, 21

* Exam #2 - Next Thursday

- Linear Functions & General Functions
- 9.1, 9.2, 9.3, 9.4

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x y

Domain Range

(2, 5), (8, -1), (-3, 6)

① These are relations

② Test for Function

- Is there a repeated x value? (Domain value)
- {2, 8, -3}
- * No repeats \rightarrow then a function

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$x = \{2, -5, 3, 2\}$

(2, 11), (-5, -10), (3, -12), (2, 4)

* Yes, 2 is repeated. But the same y value is attached.

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(2, 4), (5, 4), (-3, -6), (2, -6)

Not a function because 2 has different y values attached to it.

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Vertical Line Test

only "one" intersection, then it is a function

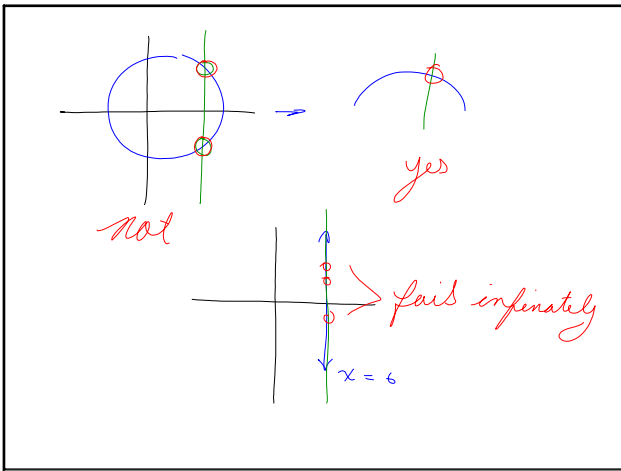
Test

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Yes

Not a function

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$$h(x) = x^2 - x$$

a) $x = 4$
 $h(4) = (4)^2 - (4)$
 $= 16 - 4$
 $= 12$

b) $x = -7$
 $h(-7) = (-7)^2 - (-7)$
 $= 49 + 7$
 $= 56$

c) $x = 3$
 $h(3) = (3)^2 - (3)$

d) $h(x) - h(x^2)$
 $= x^2 - x - [(x^2)^2 - (x^2)]$
 $= x^2 - x - [x^4 - x^2]$
 $= x^2 - x - x^4 + x^2$
 $= -x^4 + 2x^2 - x$

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$$h(x) = x^2 - x$$

$\frac{h(x+k) - h(x)}{k}$ Difference quotient

$$\frac{(x+k)^2 - (x+k) - (x^2 - x)}{k}$$

FOIL

$$\frac{[x+k][x+k] - x - k - x^2 + x}{k}$$

$$\frac{x^2 + xk + xk + k^2 - x - k - x^2 + x}{k}$$

$$\frac{2xk + k^2 - k}{k}$$

$$\frac{k^2 + 2xk - k}{k}$$

$$\frac{k(k + 2x - 1)}{k}$$

$$k + 2x - 1$$

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9.2 #33

$$f(x) = 2x^2 - 3x + 1$$

a.) $f(-x) = 2(-x)^2 - 3(-x) + 1$
 $= 2(-x)(-x) + 3x + 1$
 $= 2x^2 + 3x + 1$

c.) $f(\sqrt{x+2}) = 2(\sqrt{x+2})^2 - 3(\sqrt{x+2}) + 1$
 $= 2(x+2) - 3\sqrt{x+2} + 1$
 $= 2x + 4 - 3\sqrt{x+2} + 1$
 $= 2x + 5 - 3\sqrt{x+2}$

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9.3 #45

$$f(x) = \frac{9}{x^2 + 1 = 0}$$

Recall Division by zero is undefined $\frac{a}{0} = \text{und}$

$$\sqrt{x^2} = \pm \sqrt{-1}$$

$$x = \pm i$$

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