

9/17/2024

Review for Exam #1

Topics covered:

Functions (1.3, 1.4) and relations (1.2) (is it or isn't it, domain, range, one-to-one (5.2), etc.)

Average rate of change (2.1, p. 160)

Distance (1.1, p. 11), midpoint (1.1, p. 13), slope between two points (2.1, p. 151)

Circle $(x - h)^2 + (y - k)^2 = r^2$, (h, k) center, r = radius, diameter = $2r$, center = midpoint of a diameter (1.1)

Parabolas (intercept, vertex, vertex form) (2.3)

Symmetry (1.2, p. 26; 1.6)

Properties of graphs (increasing, decreasing, max, min, etc.) (1.6)

Piecewise graphs (1.6)

Difference quotient (1.5)

Equation of a line (parallel, perpendicular, etc.) (2.1)

Transformations (1.7)

Quadratic inequalities (2.4)

Regression (2.5)

Operations on functions (addition, subtraction, multiplication, division (1.5), composition (5.1))

Inverse functions (5.2)

$$f(x) = \sqrt{x+6}, g(x) = x^2 - 1$$

$$f(g(x)) = (f \circ g)(x) = \sqrt{(x^2 - 1) + 6} = \sqrt{x^2 + 5}$$

$$g(f(x)) = (\sqrt{x+6})^2 - 1 = x + 6 - 1 = x + 5$$

The serial method, with a specific value

$$f(g(3))?$$

$$x = 3$$

$$g(3) = 3^2 - 1 = 8$$

$$f(g(3)) = f(8) = \sqrt{8+6} = \sqrt{14}$$

$$f(x) = \sqrt{x+6}, g(x) = x^2 - 1, h(x) = \frac{x}{x+2}$$

$$h(g(f(x))) = \frac{(x+5)}{(x+5)+2} = \frac{x+5}{x+7}$$