U1 L5 Quiz Review Guide: Analyzing Graphs of Functions (1.5)

Name: _____ HR: _____

Skills: Vertical Line Test, zeros, increasing/decreasing intervals and relative extrema, average rate of change and slope, and even/odd functions.

Vertical Line Test & Zeros: A graph represents a function if no vertical line crosses it more than once.

Zeros: set f(x) = 0 and solve. Zeros are the x-intercepts.

Ex: $f(x) = x^2 + x - 12$

Fractions: set the numerator = 0 and solve. Remove those solutions from the domain.

Radicals: set Radicand ≥ 0 and solve. Solution is domain.

Increasing, Decreasing & Relative Extrema

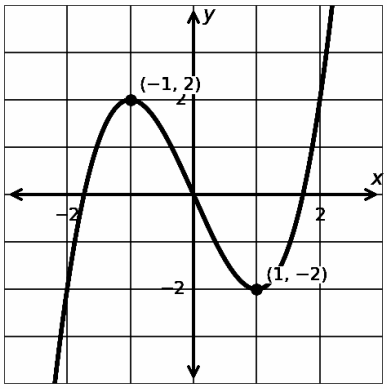
Ex: $f(x) = x^3 - 3x$

Increasing:

Decreasing:

Rel. max of ___ at x = ___

Rel. min of ___ at x = ___



Linear Functions: Constant Rate of Change

For a linear function, the rate of change is the slope. It is the same between ANY two points.

Ex: f is linear, f(2) = 7 and f(6) = −5. Find the rate of change.

f decreases ___ units for every ___-unit(s) increase in x.

Average Rate of Change

The slope of the secant line through two points: $\frac{f(x_2) - f(x_1)}{x_2 - x_1}$

Ex: $f(x) = x^2 + 3x$ from $x_1 = 1$ to $x_2 = 4$

Even, Odd, or Neither?

Find f(−x) and simplify. Even: f(−x) = f(x), symmetric about the y-axis. Odd: f(−x) = −f(x), symmetric about the origin.

Ex: $f(x) = x^4 - 3x^2$

Ex: $g(x) = x^3 + 2x$

Ex: $h(x) = x^2 + x$

Rate of Change in Context

Units are always (output units) per (input unit).

Ex: A ball's height in feet after t seconds is $h(t) = -16t^2 + 64t + 4$. Find the average rate of change from t = 0 to t = 1.

On average, how fast does the ball go up each second?

Can You…?

☐ Use the Vertical Line Test?

☐ Find zeros algebraically and check them on a graph?

☐ Find the rate of change (slope) of a linear function?

☐ State increasing/decreasing intervals and relative extrema?

☐ Find and interpret an average rate of change?

☐ Decide algebraically if a function is even, odd, or neither?