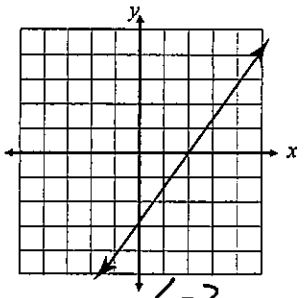
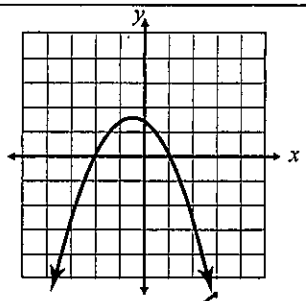
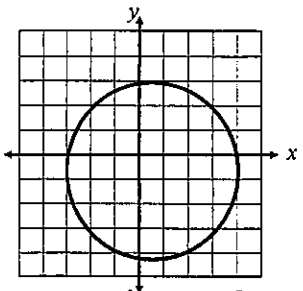
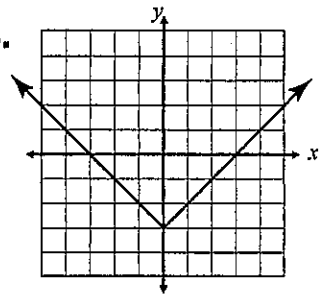
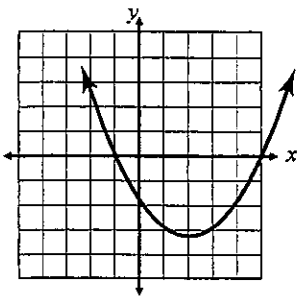
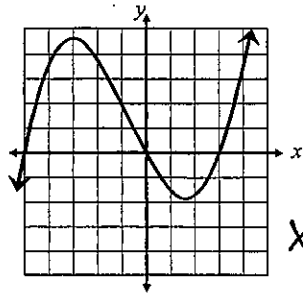
Name:	Date:
Topic: Zeros of Functions	Class:

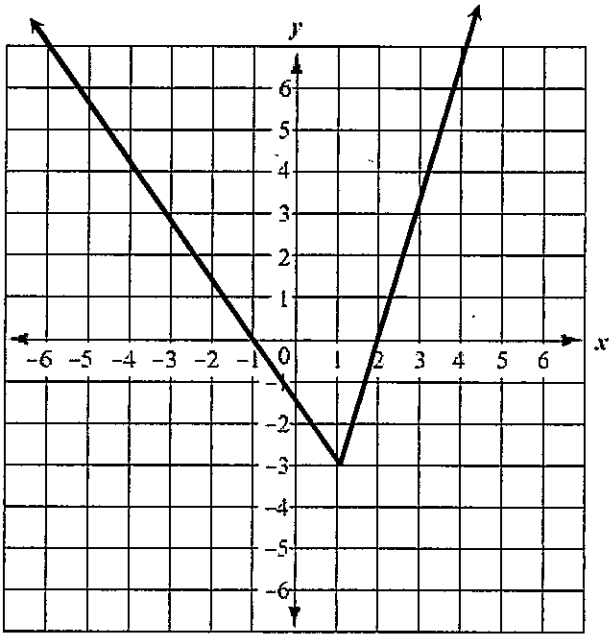
Main Ideas/Questions	Notes
DEFINITION	-Graphically, the point(s) at which the graph cross/intersects the x-axis -Algebraically, the point(s) at which $f(x)=0$
What are they also called?	Roots, x-intercepts, or solutions
GIVEN GRAPH	1.  $x=\{2\}$ 2.  $x=\{-2,1\}$ 3.  $x=\{-3,4\}$ 4.  $x=\{-3,3\}$ 5.  6.  $x=\{-5,0,3\}$

Main Ideas/Questions	Notes
ALGEBRAICALLY (By hand) **Step 1:** **Step 2:**	**1.** $f(x) = 4x - 8$ $0 = 4x - 8$ $+8 \quad +8$ $\frac{8}{4} = \frac{4x}{4}$ $x = 2$ **2.** $f(x) = 2x + 2$ $0 = 2x + 2$ $-2 \quad -2$ $\frac{-2}{2} = \frac{2x}{2}$ $x = -1$ **3.** $f(x) = -x + 7$ $0 = -x + 7$ $-7 \quad -7$ $-7 = -x$ $x = 7$ **4.** $f(x) = \frac{2}{3}x - 6$ $0 = \frac{2}{3}x - 6$ $+6 \quad +6$ $\frac{3}{2} \cdot 36 = \frac{2}{3}x \cdot \frac{3}{2}$ $x = 9$ **5.** $f(x) = \frac{1}{2}x + 2$ $0 = \frac{1}{2}x + 2$ $-2 \quad -2$ $\frac{2}{1} \cdot -2 = \frac{1}{2}x \cdot \frac{2}{1}$ $x = -4$ **6.** $f(x) = -\frac{2}{5}x + 4$ $0 = -\frac{2}{5}x + 4$ $-4 \quad -4$ $\frac{-5}{2} \cdot -4 = -\frac{2}{5}x \cdot \frac{-5}{2}$ $x = 10$
BY GRAPHING CALCULATOR **Step 1:** Hit [Y =] to enter the function **Step 2:** Hit [GRAPH] to view the graph.	**1.** $f(x) = x^2 - 16$ $x = \{-4, 4\}$ **2.** $f(x) = 5x^2 + 5x - 30$ $x = \{-3, 2\}$ **3.** $f(x) = -x^2 - 2x + 24$ $x = \{-6, 4\}$ **4.** $f(x) = x^2 + 7x - 8$ $x = \{-8, 1\}$ $-1(x^2 - 7x + 10)$ **5.** $f(x) = x^2 - 3x - 28$ $x = \{-7, 4\}$ **6.** $f(x) = -x^2 + 7x - 10$ $(-x+5)(x-2)$ $x = \{2, 5\}$ **7.** $f(x) = x^3 - 5x^2 + 2x + 8$ $x = \{1, 2, 4\}$ **8.** $f(x) = x^3 + 2x^2 - 15x$ $x = \{-5, 0, 3\}$ **9.** $f(x) = 3x^3 - 3x$ $x = \{-1, 0, 1\}$ **10.** $f(x) = x^4 + 2x^3 - 25x^2 - 50x$ $x = \{-5, -2, 0, 5\}$

Analyzing Graphs

DIRECTIONS: Given the graph below, write a description in words. Use the elements of the vocabulary list below. Be very descriptive as if you were teaching somebody how to analyze the graph.

VOCABULARY: DISCRETE OR CONTINUOUS GRAPH, DOMAIN, RANGE, FUNCTION, VERTICAL LINE TEST, ZEROS



This is a continuous graph that has a domain of all real values. It also has a range of -3 to infinity on the y-values. This is a function because it passes the vertical line test. Its zeros are at -1 and 2.