

Math 120 Winter 2001 Quiz 2

Name _____
Section _____
TA _____

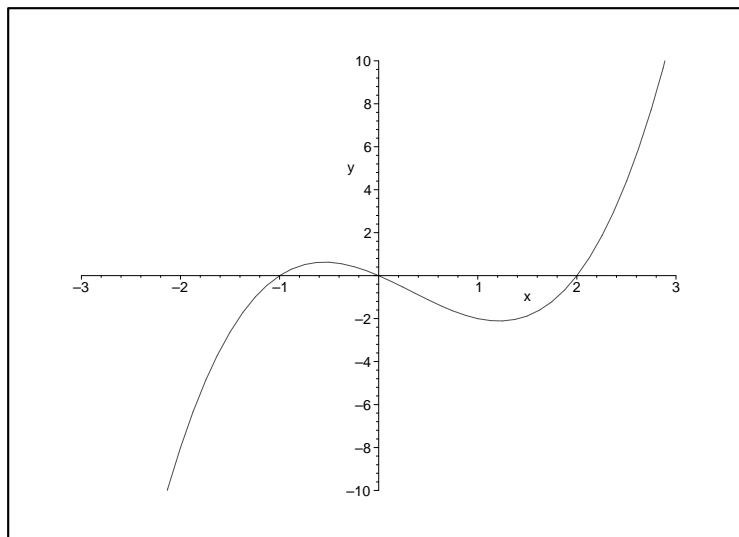
This is a closed book exam. One sheet of formulas is allowed. You have 20 minutes. Justify all your answers.

Problem 1 Let $f(x) = \sqrt{1-x^2}$

a)(3 points) What is the domain of $f(x)$?

b)(3 points) Calculate $f(h+1)$. Simplify as much as possible.

c)(3 points) Given the graph of $g(x)$ below, calculate $g(-2)$



Problem 2 Farmer Ben currently uses 75 lb of fertilizer a year, to fertilize his apple orchard. On average the orchard yields 100 bushels of apples every year. Some experimental research suggests that the yield of an orchard that size increases of 0.5 bushel per pound of fertilizer, as long as an amount of fertilizer between 30 lb and 100 lb is used. Too much fertilizer is harmful, and the research predicts the yield to decrease of about 1 bushel per every pound of fertilizer applied in excess of 100 lb. Let $Y(x)$ the function that gives the yield of the orchard (in bushels) as a function of the amount x of fertilizer (in lb) applied.

a)(2 points) How many bushels should farmer Ben expect his orchard to yield if he applied 80 lb of fertilizer ? (In other words, what is $Y(80)$?)

b)(2 points) Write a formula for $Y(x)$, valid in the domain $30 \leq x \leq 100$;

c)(2 points) Write a formula for $Y(x)$, valid in the domain $30 \leq x \leq 150$

d)(2 points) Draw a graph of $Y(x)$ in the domain $30 \leq x \leq 150$

e)(2 points) If the research is correct, can farmer Ben get 150 bushels from his orchard, by changing the amount of fertilizer he applies ? Explain.