

Show complete work for this quiz, or no credit will be awarded. This will be the protocol for all remote testing now that we will be online. Work on your own. You may use notes and book, but your own work must be evident.

For the following functions, fill in the information and sketch the function accurately! When a question asks for a feature that the function doesn't have, write "NONE." Asymptotes in equation form.

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

a. Domain f :

b. Vertical asymptote:

c. Horizontal asymptote (support your answer with the limit explanation):

d. Intercepts in ordered pair form (x, y) :

e. Find $f'(x)$, and give it in form similar to second derivative, which is done for you. No negative exponents. (Be sure to check $f''(x)$ follows from your $f'(x)$.)

$$f'(x) =$$

$$f''(x) = \frac{6x^2 - 2}{(1+x^2)^3}$$

f. Critical number(s): $c =$

For next features, show your work, as found from a number line with test values.

g. Intervals on which f increases:

Intervals on which f decreases:

h. Local maximum, as ordered pair (x, y) :

Local minimum, as ordered pair (x, y) :

i. Intervals on which f is concave up:

Intervals on which f is concave down:

j. Points of inflection, as ordered pair (x, y) :

k. Sketch $f(x)$ on the axes below, using the scale shown:

