Name_____

UNIT 5 TEST

K:	**/9**
T:	**/4**
A:	**/10**
C:	**/8**

KNOWLEDGE[11]

1. Sketch the graph and identify each of these characteristics of $f(x)$. [5]

$$f(x) = \frac{1}{-(x-4)^2+1}.$$

a) x-intercepts

b) y-intercepts

c) vertical asymptotes

d) horizontal asymptotes

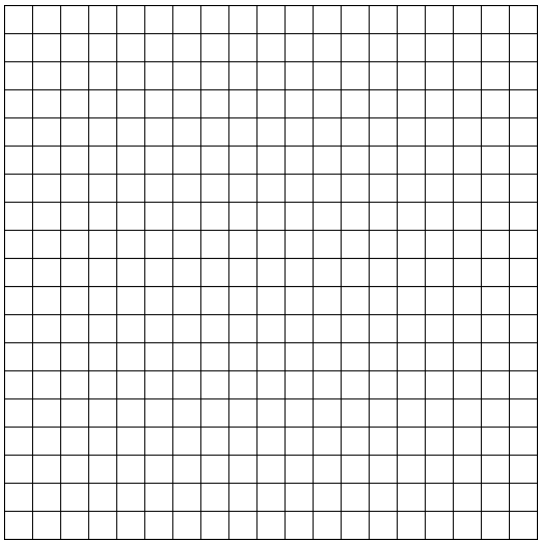
e) intervals where $f(x)$ is positive or negative

f) domain,

g) range

h) intervals of increase

i) intervals of decrease



2. Solve $\frac{4x}{x-2} = \frac{3x-2}{x-2}$.[2]

3. Find the solution set for $2x-1<\frac{x+7}{x+1}$ and write your answer in interval notation.[2]

THINKING[4]

1. Let $f(x)=\frac{x-2}{x+2}$ and $g(x)=4x-1$ For what interval(s) is $f(x)<g(x)$?[2]

2. State the intervals in which the **reciprocal** of $y=(x-3)(x+1)$ is increasing or decreasing. [2]

APPLICATION[10]

1. Solve the following equation algebraically.

$$\frac{x}{x+1}=\frac{1}{3}+\frac{x-1}{x+3}$$

[3]

2. The profit function for producing blank CD's was projected to be $P(x) = x^2 + 5x - 6$ where x is the number of CD's produced in hundreds. The average profit for a CD is found by $\frac{P(x)}{x}$. At what level of production must the company produce the CD's for the average profit to be greater than zero?[2]

3. The St. Paul Wolverines bought pizza for $900 to sell at a basketball game. They kept 10 pizzas to feed the players after the game and sold the rest for $1040. There were 8 slices in each pizza box. Their profit was $4 per box.

a. How many pizzas were in the original order?

[3]

b. What was the original price of each pizza? [1]

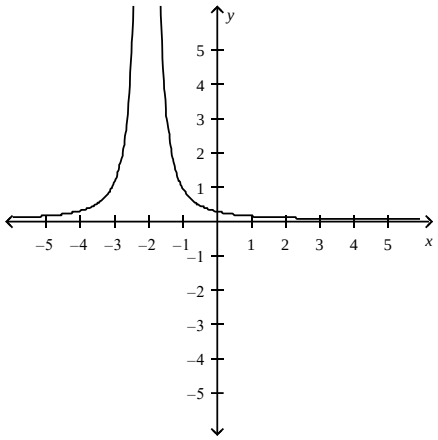
c. What did they charge per slice? [1]

COMMUNICATION[8]

1. Does the equation $\frac{x+5}{x+8}=\frac{x}{x+3}$ have any solutions? If it does, list them. If it does not, explain why.

[2]

2. Explain how you know this is not the graph of the reciprocal function of $f(x)=(x-2)^2$.



[2]

3. Explain how you can use the expression in the numerator and the denominator of a rational function to decide if the graph has: [4]

a) a hole

b) a vertical asymptote

c) a horizontal asymptote

d) an oblique asymptote