Name **Key**   Date _____ Pd ____

7.1 Rational Functions DAY THREE CYU

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Real-World Application with Rational Functions	1	3, 4	2
Reasonable domain restrictions	1	3, 4	2

Solve the world problems. Show all thought process to earn full credit. Think about notation and units.

1. The total revenue from the sale of a popular book is approximated by the rational function $R(x) = \frac{1000x^2}{x^2+4}$, where x is the number of years since publication and R(x) is the total revenue in millions of dollars.

   a) Find the total revenue at the end of the first year.

   $200 million

   b) Find the total revenue at the end of the second year.

   $500 million

   c) Find the revenue during the second year only.

   $300 million

   d) Find a reasonable domain for the function of R.

   (0, 100]   answers may vary

2. The function $f(x) = \frac{100,000x}{100-x}$ models the cost in dollars for removing x percent of the pollutants from a bayou in which a nearby company dumped creosol.

   a) Find the cost of removing 20% of the pollutants from the bayou. [HINT: Find f(20)]

   $25,000

   b) Find the cost of removing 60% of the pollutants and then 80% of the pollutants.

   $150,000; $400,000

   c) Find the domain of function f that seems reasonable.

   $x \neq 100$ (0, 100)

3. The dose of medicine prescribed for a child depends on the child's age A in years and the adult dose D for the medication. Young's Rule is a formula used by pediatricians that gives a child's dose C as $C = \frac{DA}{A+12}$.

a) What does the A stand for in the formula?

child's age

b) What does the D stand for in the formula?

adult dose

c) What does the C stand for in the formula?

child's dose

d) What would be a reasonable domain for Young's Rule?

$[8, 13)$

e) Suppose that an 8-year-old child needs medication, and the normal adult dose is 1000mg. What size dose should the child receive?

400 mg

4. Calculating body-mass index is a way to gauge whether a person should lose weight. Doctors recommend that body-mass index values fall between 18.5 and 25. The formula for body-mass index B is $B = \frac{703w}{h^2}$, where w is weight in pounds and he is height in inches. Should a 148-pound person who is 5 feet 6 inches tall lose weight? ALSO, give a reasonable domain.

no; $B \approx 24$

$(0, 750]$