

Name Key

Date \_\_\_\_\_ Pd \_\_\_\_\_

**7.1 Rational Functions DAY THREE CYU**

Use when you get it right all by yourself  
*S* Use when you did it all by yourself, but made a silly mistake  
*H* Use when you could do it alone with a little help from teacher or peer  
*G* Use when you completed the problem in a group  
*X* Use when a question was attempted but wrong (get help)  
*N* Use when a question was not even attempted

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] answer 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  $h$  is height in inches. Should a 148-pound person who is 5 feet 6 inches tall lose weight? ALSO, give a reasonable domain.

no;  $B \approx 24$

$(0, 750]$

**CYU Reflection:** How far can you go: basic, intermediate, or advanced?

**Rate your mastery level!**

How confident are you with the skills this CYU covered? Circle the score you would give yourself.

