

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
Vocabulary terms	1 - 5		
Domain restriction in interval notation	6	7	8
Simplifying expressions	9, 10, 12	11	16
Synthetic Substitution	13		
Real world application		14, 15	
Multiplying Rational Expressions	17	18	19
Dividing Rational Expressions	20	21	22

*Vocabulary Check: Use the choices below to fill in each blank.*

- 1 true rational simplified -1 false domain 0 opposites reciprocals**
- A \_\_\_\_\_ expression is an expression that can be written as the quotient of P and Q of two polynomials P and Q as long as Q does not equal 0.
  - A rational expression is undefined if the denominator is \_\_\_\_\_.
  - The \_\_\_\_\_ of the rational function  $f(x) = \frac{2}{x}$  is all real numbers except 0.
  - A rational expression is \_\_\_\_\_ if the numerator and denominator have no common factors other than 1 or -1.
  - The expression  $\frac{x}{2y}$  and  $\frac{2y}{x}$  are called \_\_\_\_\_.

**Restrict the domain of each rational expression in interval notation. Show all work for full credit.**

6.  $f(x) = \frac{4-3x}{2}$

7.  $s(t) = -\frac{5t+t^2}{3t}$

8.  $g(x) = \frac{-2}{2x+5}$

**Simplify each expression. Show all work for full credit.**

9.  $\frac{y+9}{9+y}$

10.  $\frac{-4x-4y}{x+y}$

11.  $\frac{12x^2+4x-1}{2x+1}$

12.  $\frac{49-y^2}{y-7}$

**Find each function. Show all work for full credit.**

13. If  $f(x) = \frac{x-2}{-5+x}$ , find...

a)  $f(-5)$ .

B)  $f(0)$ .

C)  $f(10)$ .

**Solve the real word problem. Show all work for full credit.**

14. 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.

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

c) Find the domain of function  $f$ .

15. 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?

16. Does  $\frac{x+7}{x}$  simplify to 7? Why or Why not, show your explanation in words if you need to?

**Find each product and simplify completely, if possible. Show all work for full credit.**

17.  $\frac{9x^2}{y} \cdot \frac{4y}{3x^3}$

18.  $\frac{4x-24}{20x} \cdot \frac{5}{x-6}$

19.  $\frac{x^2+9x+20}{x^2-15x+44} \cdot \frac{x^2-11x+28}{x^2+12x+35}$

**Find each quotient and simplify completely, if possible. Show all work for full credit.**

20.  $\frac{5x^7}{2x^5} \div \frac{15x}{4x^3}$

21.  $\frac{(x+3)^2}{5} \div \frac{5x+15}{25}$

22.  $\frac{9x^5}{a^2-b^2} \div \frac{27x^2}{3b-3a}$

**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.

