

Name _____

Homework #2, Math 104, Fall 2008

Instructions: Complete the following problems and write your final solutions on the homework paper and submit. Attach pages with work. All steps must be shown in order to receive credit. All solutions must be in fraction form, not in decimal form, unless otherwise noted.

1. Solve the following equation and write the solution in set notation. Be sure to check of extraneous solutions that make the original problem undefined.

$$\frac{12}{9 - a^2} + \frac{3}{3 + a} = -\frac{4}{2a - 6}$$

2. A hurricane strikes and a rural area is without food or water. Three crews arrive. One can dispense needed supplies in 10 hours, a second in 15 hours and a third in 20 hours. How long will it take all three crews working together to dispense food and water? What equation represents this problem? Write your answer in hours and minutes format. You may round to the nearest minute.
3. A snowstorm causes a bus driver to decrease the usual average rate along a 60-mile route by 15 mph. As a result, the bus takes two hours longer than usual to complete the route. At what average rate does the bus usually cover the 60-mile route? What equation will you use to solve this? Write your answer in mph rounded to the nearest whole number if necessary.

4. Two investment rates differ by 1%. An investment for 1 year at the lower interest earns \$175. The same principle invested for a year at the higher rate earns \$200. What are the two interest rates? Write the equation you will use to solve the problem. Write the solution in percent form.

5. One's intelligence quotient, or IQ, varies directly as a person's mental age, and inversely as that person's chronological age. A person with a mental age of 25 and a chronological age of 20 has an IQ of 125. What is the chronological age of a person with a mental age of 40 and an IQ of 80? Write the general equation you will use, the value of the constant of proportionality you find, and the solution.

6. Describe the following equations in words:

a. $z = \frac{k\sqrt{x}}{y^2}$

b. $C = \frac{kPM}{d^4}$

c. $x = kz \quad y = w$

7. Find the domain and range of the following equations. Write your answers in interval notation.

a. $f(x) = \sqrt{2x+3}$

b. $g(x) = 3 - \sqrt{x-8}$

c. $h(x) = \sqrt[3]{3x+4}$