



ADULT LEARNING ACADEMY

PRE-ALGEBRA WORKBOOK

UNIT 4: RATIOS AND PROPORTIONS

Debbie Char and Lisa Whetstine

St. Louis Community College

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MoHealthWINS

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LEARNING OBJECTIVES**1. Ratios:**

- Express ratios using 3 different types of notation: words, semicolons (:), and fractions
- Place terms in the correct order when writing and converting ratios
- Simplify ratios, including ratios involving fractions
- Write equivalent ratios

2. Proportions:

- Compare ratios and determine if they are true proportions
- Solve proportion problems by setting up proportions and solving for unknown values
- Use proportional reasoning to perform measurement conversions

3. Word Problems:

- Set up and solve word problems involving ratios, rates and proportions, including applications to the healthcare industry

Topic	Website	Videos	Exercises
Ratios	www.khanacademy.org	Introduction to Ratios Ratios as Fractions in Simplest Form Simplifying Rates and Ratios	Expressing Ratios as Fractions Ratio Word Problems
Proportions	www.khanacademy.org	Writing Proportions Understanding Proportions	Writing Proportions Proportions 1
Unit 4 Review Powerpoint	www.stlcc.edu	Unit 4 Review Flashcard Ppt on Blackboard	
Compass Practice	http://www.hostos.cuny.edu/oa/compass/pre-alg_prac10.htm		Proportions

Use a reliable website to fill in these conversions. They will be helpful as you solve proportion problems.

1 pound = _____ ounces

1 gallon = _____ quarts

1 quart = _____ pints

1 quart = _____ ounces

1 cup = _____ ounces

1 tablespoon = _____ teaspoons

1 teaspoon = _____ milliliters

1 kilogram \approx _____ pounds

1 foot = _____ inches

1 yard = _____ feet

1 mile = _____ feet

1 mile = _____ yards

1 inch \approx _____ centimeters

I. The following are ratios of the number of patients to the number of nurses on a hospital floor. Simplify the ratio to determine how many patients per one nurse.

a) 40:4 _____

b) 55:11 _____

c) 168:14 _____

d) 52:13 _____

e) 48:8 _____

II. Check the following ratios to see if they are true proportions. Write yes or no on the line provided. (hint: cross multiply and compare products)

a) $50:30 = 5:3$ _____

b) $100:4 = 25:1$ _____

c) $16:15 = 8:7$ _____

d) $90:45 = 9:5$ _____

e) $18:3 = 9:1.5$ _____

III. Healthcare workers who administer medicine must have a clear understanding of how to compute dosage calculations. A certain medicine must be administered in the ratio of 10 cc per every 25 pounds. Compute the amount of medicine (cc) needed for the following patients. Their weight in pounds is given. Round to the nearest tenth, if necessary.

a) 50 pounds _____

b) 100 pounds _____

c) 200 pounds _____

d) 8 pounds _____

e) 135 pounds _____

f) 57 pounds _____

g) 277 pounds _____

IV. Use proportional reasoning to convert each measurement:

a) 5 cups = _____ pints

b) 7 quarts = _____ gallons

c) 34 ounces = _____ pounds

d) 5 feet = _____ inches

e) 10 miles = _____ feet

f) 12 teaspoons = _____ tablespoons

g) 500 yards = _____ feet

h) 200 pounds = _____ kilograms

i) 10 pints = _____ quarts

V. Solve the following proportion problems by setting up a proportion and solving for the unknown. Show your work.

a) Two tablets of ulcer medication contain 250 milligrams of medication. How many milligrams are in eight tablets?

b) If a dose of 72 milligrams of medication is contained in 4 cc, 24 milligrams would be contained in how many cc?

c) If 15 grams of pure drug are contained in 150 milliliters, how many grams are contained in 50 milliliters?

d) A tablet contains 75 milligrams of medication. If a doctor orders 300 milligrams of medication for a patient, how many tablets should be given to the patient?

e) A tablet contains 30 milligrams of medication. If a doctor orders 15 milligrams of medication for a patient, how many tablets should be given to the patient?

VI. The following problems involve carbohydrates, fats, and protein. Use the information given below to complete the proportions.

Carbohydrates → 4 calories per 1 gram

Fats → 9 calories per 1 gram

Proteins → 4 calories per 1 gram

- a) 27 calories of fat = _____ grams
- b) 88 calories of protein = _____ grams
- c) 360 calories of carbohydrates = _____ grams
- d) _____ calories in 12 grams of protein
- e) _____ calories in ½ gram of carbohydrates
- g) _____ calories in 16.25 grams of fat

VII. Solve the following problems by setting up a proportion and solving for the unknown.

- a) One cup of soup contains 450 milligrams of sodium. How much sodium would there be in one and a half cups of soup?
- b) A ½ cup serving of fresh fruit contains 72 milligrams of potassium. If a person wanted to consume 288 milligrams of potassium, how many ½ cup servings would they need to eat?
- c) If a can of soup has 2.5 servings, how many cans would be needed to serve 22 people?

- d) If one serving of pasta salad contains 90 calories, how many calories are in 3.5 servings?
- e) If a doctor ordered four ounces of prune juice four times a day for seven days, how many total ounces would be served to the patient?
- f) Three out of ten people have high blood pressure. In a typical crowd of 400 people, how many would be likely to have high blood pressure?
- g) A newborn baby weighing 5 pounds is in need of some medicine. The dosage for the medicine is 10cc (cubic centimeter) per 1 kilogram. The baby's weight on the chart is recorded in pounds and not in kilograms. If one kilogram = 2.2 pounds, how many cc of medicine should be given to the baby?'