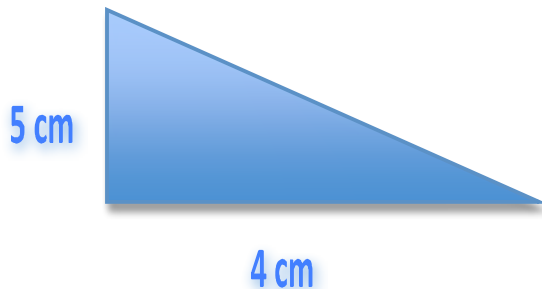


## Quiz 3 VA TH

**Directions:** Read and follow ALL directions. **Do not copy off of others.** You may work together, but write up the answers in your own words and show your own work. **Write neatly! If I can't read it...IT'S WRONG!**

1. Draw Venn diagrams to represent the following relationships:
  - a. All Americans are people who vote.
  - b. No carpenters are engineers.
  - c. If an odd number times an odd number is an odd number, then five times three equals an odd number.
  - d. Some smokers have lung cancer. (Some smokers are people who have lung cancer.)
2. Consider the triangle below. Determine the length of the hypotenuse in **inches**. Round all answers to two decimal places. Explain how you arrived at your answer and what mathematical ideas you used.



3. Gas mileage for vehicles varies based on driving conditions such as speed. Suppose your car averages 38 miles per gallon during highway driving at an average speed of 55 miles per hour, but gets only 32 miles per gallon on the highway if you drive at an average speed of 70 miles per hour. Answer the following:
  - a. What is the driving time for a 2500 mile trip if you drive at an average speed of 55 miles per hour? What is the driving time if you drive at an average speed of 70 miles per hour?
  - b. Take gasoline prices to be \$3.50 per gallon. What is the cost for gasoline on this 2500 mile trip if you average 55 miles per hour? How about the cost if you average 70 miles per hour?
4. You are planning to purchase a new home. Using the discussion on page 139 – 142 as a guide (this was also covered in class), answer the following questions.
  - a. Home A has a price tag of \$220,000. Home B costs \$190,000.
    - i. Using home A as the reference value, determine the absolute and relative differences between the two choices. Write the relative difference using a percent.

- ii. Using home B as the reference value, determine the absolute and relative differences between the two choices. Write the relative difference using a percent.
  - b. Explain what the absolute and relative differences are saying in part i. In other words, describe in a paragraph what the answers mean.
5. Do the following statements make sense? Explain why or why not.
  - a. Jacob is 120% shorter than Tom.
  - b. Since the start of the recession, the cost of homes has fallen by 100%.
  - c. The cost of electronic devices has increased by 50%, that's an increase of 150%!
  - d. An F-16C is 130% slower than an F-22A.
  - e. A Boeing 747 is 130% faster than a Learjet 28.
6. Given the following conversion factors and information, compute the approximate distance in miles from the Earth to Proxima Centauri, the nearest star to our planet (excluding the sun.) **SHOW ALL WORK!**  
Distance from Earth to Alpha Centauri: 4.37 light-years (ly)  
Note: A light-year is the distance light travels in one year.  
Light travels at a speed of 186 thousand miles per second.  
  
HINTS: Use a calculator. Round all your numbers to three significant digits to make things easier. You'll want to use scientific notation in this problem since the numbers will be VERY LARGE. When done, you should find Proxima Centauri is somewhere between 22 trillion miles and 28 trillion miles distant from Earth.
7. Using your answer in problem 6, determine how long it would take in years for you to reach Proxima Centauri if flying non-stop in a 747 traveling at 500 miles per hour.