8th Grade Assignment – Week #9

Test!!

- Next week's assignment will include the Pythagorean Theorem unit test. The test may include questions similar to or related to any of the problems that appeared on the practice sheets in the workbook.

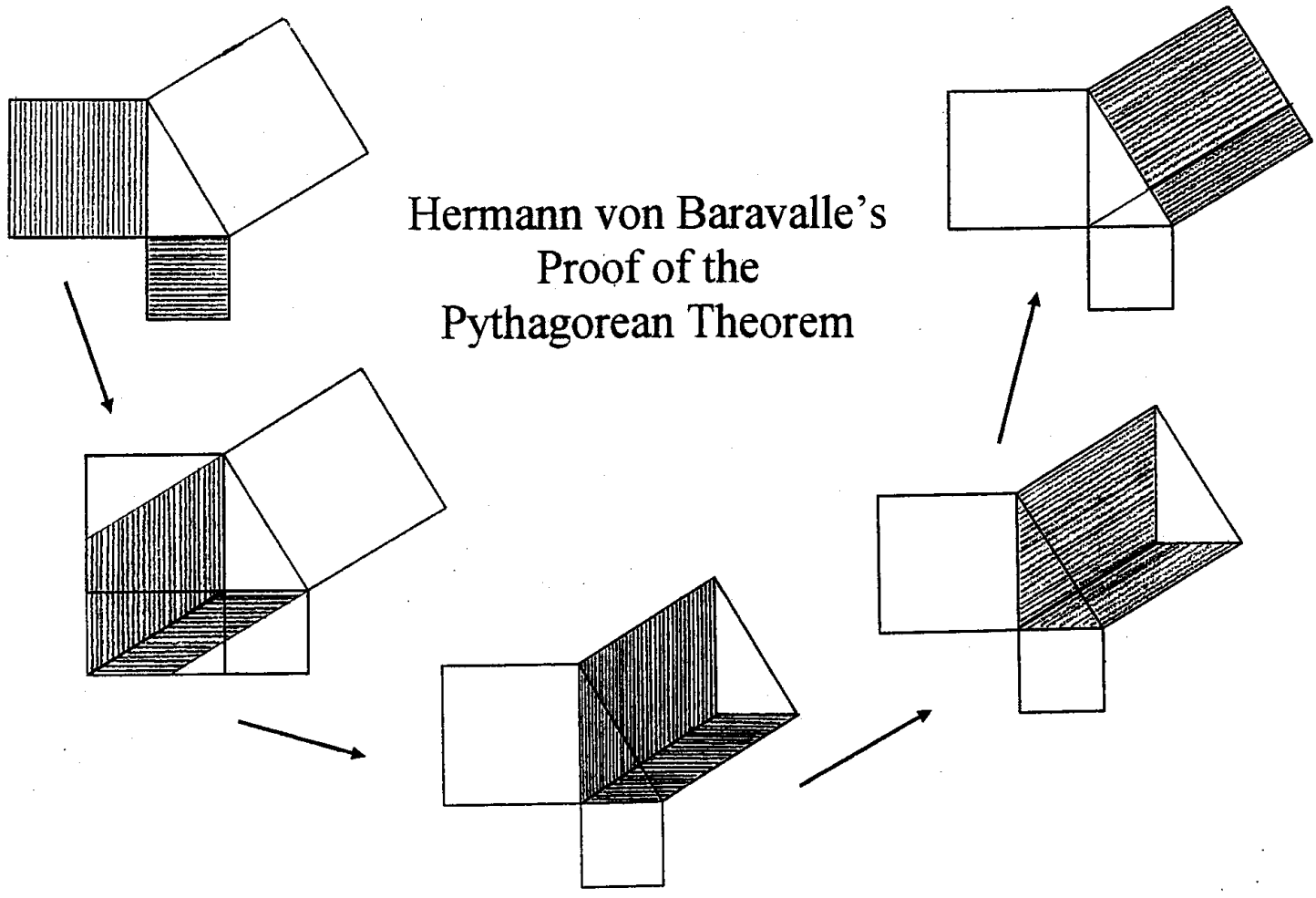
Individual Work

- In preparation for the test, you should work through the problems on **Practice Sheet #4 and Practice Sheet #5**. You should focus on the problems which you need to practice the most. Save the challenge problems to do with your group.

Group Assignment: for Tuesday and Thursday

- **Part I**
  The Pythagorean states: "*With any right triangle, the area of the square of the hypotenuse is equal to the sum of the areas of the squares of the other two sides.*"

  Explain to each other how the below drawings explain (using the *Shear and Stretch*) why the Pythagorean is true.



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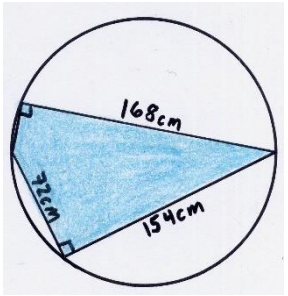
Group Assignment (continued):

- **Part II**
  Work through the challenge problems on **Practice Sheet #4** and **Practice Sheet #5**.

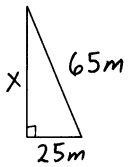
- **Part III** (For those groups needing an extra challenge problem)
  Ptolemy's Quadrilateral Theorem (which I normally cover in 10^{th} grade) states:
  With any quadrilateral inscribed in a circle, the product of its diagonals is equal to the sum of the products of the opposite sides.
  With the drawing shown here, find the following:
  (1) The length of the fourth (shortest) side of the quadrilateral.
  (2) The length of the two diagonals.
  (3) The area of the quadrilateral.



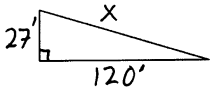
Pythagorean Theorem – Practice Sheet #4

1) Find X, either by using the *Hypotenuse Formula* $c^2 = a^2 + b^2$, or the *Leg Formula* $a^2 = c^2 - b^2$.

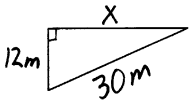
a)



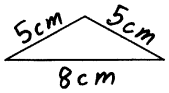
b)



c)



d) Calculate the height.



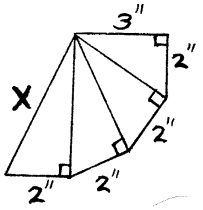
2) Calculate $\sqrt{19}$, rounded to five significant digits.

3) Calculate the length of the diagonal of a square that has sides with a length of…

a) 4 inches.

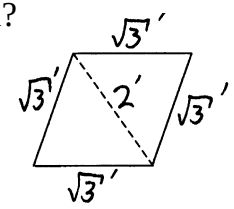
b) 5½ inches.

4) Find X.



5) *Challenge!*
Find a shortcut or a formula to do the above problem more quickly.

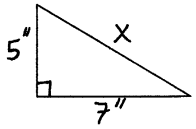
6) A rhombus has edges of length $\sqrt{3}$ feet and its short diagonal is 2 feet long. How long is its long diagonal?

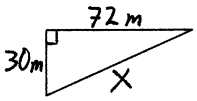


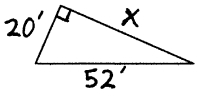
7) *Challenge!*
A pyramid has a square base, and all of its edges are 20m long. Calculate the height of the pyramid.

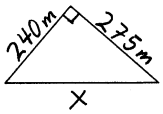
Pythagorean Theorem – Practice Sheet #5

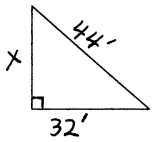
1) Circle those that can be done using Pythagorean triples, and then solve them. Do the others by using either the *Leg Formula* or the *Hypotenuse Formula*.

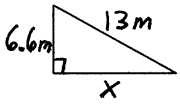
a) 

b) 

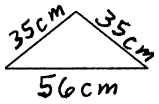
c) 

d) 

e) 

f) 

g) Calculate the height.



2) Below, you are given the length of the three sides of a triangle. State whether the triangle is right, obtuse, or acute.

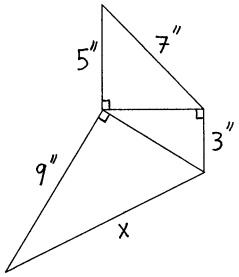
a) a=6; b=12; c=14

b) a=25; b=20; c=30

c) a=3.9; b=8; c=8.9

3) Use the square root algorithm to calculate $\sqrt{24700900}$.

4) Find X.



5) *Challenge!* Calculate the perimeter of a square that has a 6-inch long diagonal.