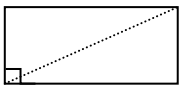
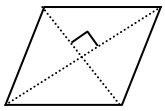
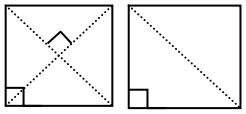
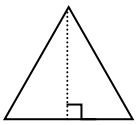
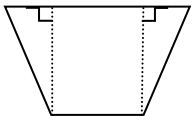
Geometry LAB Name: _____ Section: _____ Date: _____

APPLYING THE PYTHAGOREAN THEOREM TO DIAGONALS AND ALTITUDES

RECTANGLE	RHOMBUS	SQUARE	TRIANGLE	TRAPEZOID
Rt. △'s are formed by diagonals 	Diagonals are ⊥ forming Rt. △'s 	Rt. △'s are formed by diagonals 	Altitudes are ⊥ to base forming Rt. △'s 	Altitudes are ⊥ to bases forming Rt. △'s 

PROBLEM SET 8-1 LAB: Draw a picture to justify your work. Show all work.

1. Which set of numbers could be the lengths of sides of a right triangle?
   a. 4, 6, $\sqrt{40}$
   b. 2, 6, $\sqrt{40}$
   c. 2, 18, 20
   d. 4, 36, 40

2. The ratio of the lengths of the legs of a right triangle is 5: 12. What is the ratio of the length of the shorter leg to that of the hypotenuse?

   a. 13 : 5 b. $\sqrt{119}$: 5 c. 5 : 13 d. 5 : $\sqrt{119}$

3. If the length of a side of a square ABCD is 5, find the length of AC.

4. A rectangle has a diagonal of length 12 and one side of length 6. What is its perimeter?

5. The length of each side of a rhombus is 13. If the length of the shorter diagonal is 10, find the length of the longer diagonal.

6. In rectangle ABCD, AB = x, BC = 12, and diagonal BD = x + 8. Find BD. Draw a picture first!

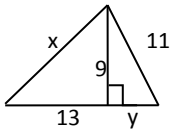
7. The length of a rectangle is 7 inches more than its width. If the diagonal has a length of 17 inches, draw a picture and write an equation that could be used to find the dimensions of the rectangle in terms of its width.

8. Solve $(x+1)^2 = 9$

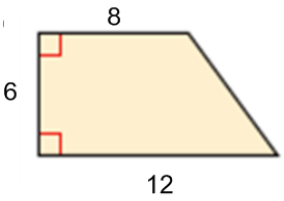
9. Solve $x^2 + 5x - 24 = 0$

For 10 & 11, give your answers in simplest radical form.

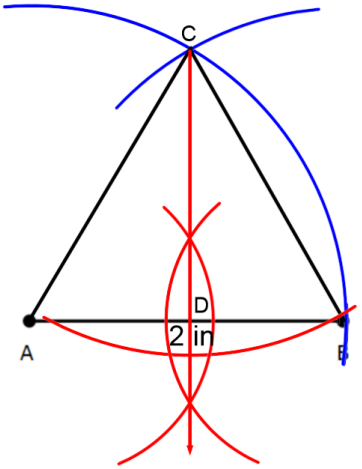
10. Find the area of the largest triangle.



11. Find the perimeter of the trapezoid.



12. Given the construction of equilateral triangle ABC with a side length of 2 inches with the altitude $\overline{CD}$ where D is the point of intersection with the base $\overline{AB}$



Fill in the measures of the following:

i. $m\measuredangle ADC =$ _____ ° and $m\measuredangle BDC =$ _____ °

ii. $m\measuredangle A =$ _____ ° and $m\measuredangle B =$ _____ °

iii. $m\measuredangle ACD =$ _____ ° and $m\measuredangle BCD =$ _____ °

iv. AC = _____ inches = BC

v. AD = _____ inches = BD

vi. CD = _____ inches (use the Pythagorean Theorem to answer in simplest radical form)