

Name: \_\_\_\_\_  
Mathematics Period 3

Date: 5/6/15  
Ms. Wilson

**Using Formulas  
Classwork**

1.) Heron's Formula for finding  $A$ , the area of a triangle, is  $A = \sqrt{s(s-a)(s-b)(s-c)}$ , where  $s$  is the semi-perimeter of the triangle,  $s = \frac{a+b+c}{2}$ , and  $a$ ,  $b$ , and  $c$  are the lengths of the sides of the triangle.

a.) What is the semi-perimeter of a triangle whose sides are 5, 12, and 13?

b.) What is the area of the triangle to the nearest whole number?

c.) What kind of triangle is this triangle? How do you know?

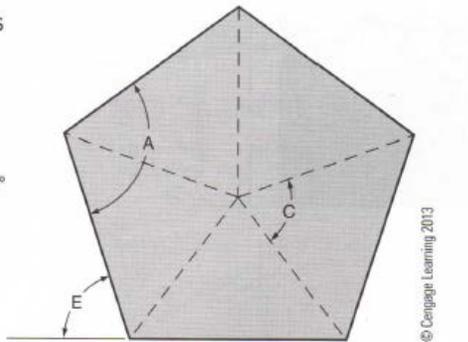
d.) How else could you have found the area of this triangle?

2.) The figure below is a regular pentagon. Use the formulas next to the pentagon and calculate the number of degrees in angles  $A$ ,  $C$ , and  $E$ .

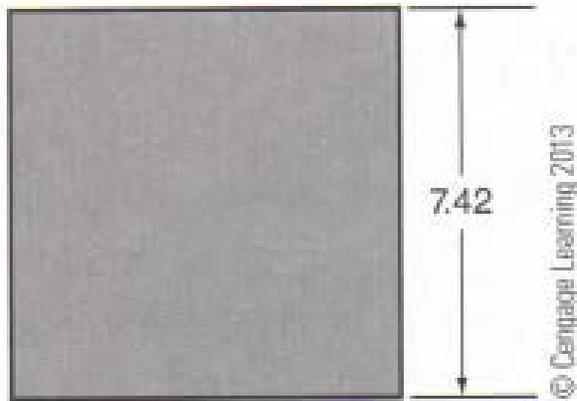
$N$  = number of sides

$$\angle C = \frac{360^\circ}{N}$$

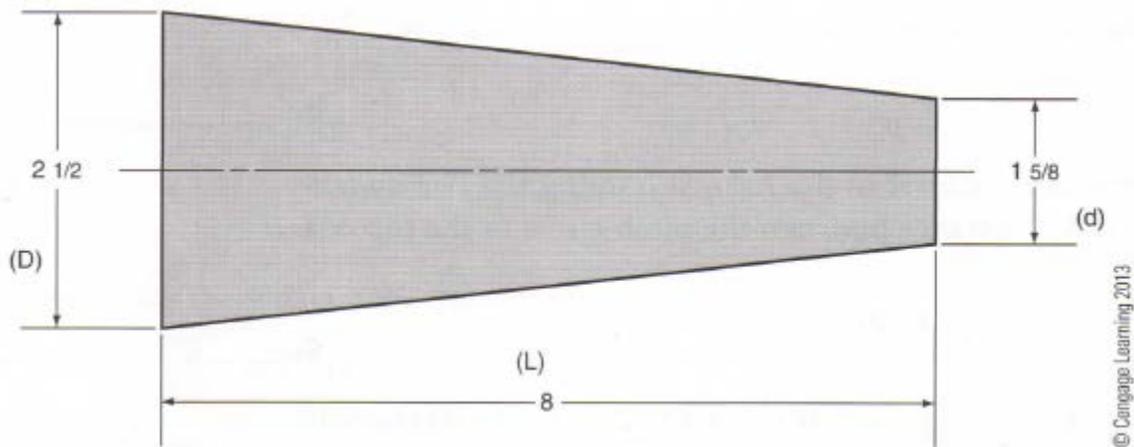
$$\angle A = \frac{N-2}{N} \times 180^\circ$$



3.) A formula for calculating the equal lengths of  $d$ , the diagonals of a square, is  $d = \sqrt{2s^2}$ , where  $s$  is the equal length of each side of the square. Calculate the length of the diagonals in the square below to the nearest hundredth.

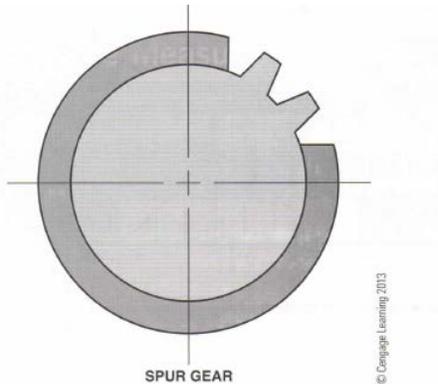


4.) Use the formula  $T = \frac{D-d}{L}$  and calculate to four decimal places the amount of taper per inch,  $T$ , for this CAD view of a tapered shaft, where  $D$  and  $d$  represent diameters of the shaft, and  $L$  represents its length.



**Using Formulas**  
**Homework – Due 5/7/15**

1.) A drafter must determine several measurements before a gear can be drawn. Most gear-cutting data can be found if the diametral pitch **P** and the number of teeth **N** in the gear are known. In this gear, the diametral pitch **P** is 4, and the number of teeth **N** is 24. Use each given formula to answer the questions below.



a.) Calculate the pitch diameter **D** to the nearest whole number.

$$D = \frac{N}{P}$$

b.) Calculate the outside diameter **O** of the gear to the nearest tenth.

$$O = \frac{N + 2}{P}$$

c.) Calculate the addendum **A** to the nearest hundredth. (The addendum is the radial distance between the pitch circle to the top of the gear tooth.)

$$A = \frac{1.000}{P}$$

d.) Calculate the thickness of the gear tooth **T** to the nearest thousandth.

$$T = \frac{1.5708}{P}$$

e.) Calculate the whole depth of the gear tooth **W** to the nearest thousandth.

$$W = \frac{2.157}{P}$$