

First name: _____ Last name: _____

Student ID: _____

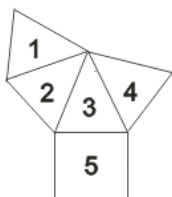
Geometry Homework

Basic problems

1. In circle O, secant \overline{ABC} and chord \overline{BD} intersect. If $m\widehat{AD} = 190^\circ$ and $m\widehat{BD} = 47^\circ$, find $m\angle CBD$.

2. As shown in the figure, you can create a pyramid by folding sides of a piece of paper up and then use masking tape to hold it together. Of the five planes containing sides of the pyramid, which two planes do not intersect?

- a) 2 and 5, b) 1 and 5, c) 2 and 4, d) All planes intersect, e) 1 and 4

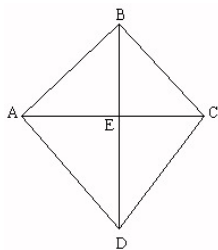


3. Given: $\angle G \cong \angle J$, $\angle T \cong \angle E$, $\angle Q$ and $\angle E$ are complementary. $\angle K$ and $\angle T$ are complementary. Which of the following(s) must be true?

- a) $\angle K$ and $\angle E$ are complementary, b) $\angle G \cong \angle T$
 c) $\angle K$ and $\angle Q$ are supplementary, d) $\angle K \cong \angle Q$ e) $\angle T \perp \angle Q$.

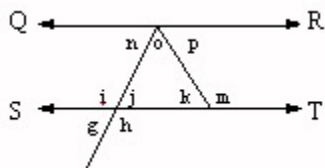
4. Given: $\triangle NKR$, $m\angle N = 60^\circ$, $m\angle K = 60^\circ$, $m\angle R = 60^\circ$. What kind of triangle is $\triangle NKR$?

5. With respect to angles C and B, what is the included side?



6. If Ms. Floop cuts a cake into slices (through the center of the cake) that have a vertex angle of 30° , how many such whole slices can be made from half a cake?

7. Given: $\overline{QR} \parallel \overline{ST}$, $m\angle g = (4x - 55)^\circ$, $m\angle k = (6x - 100)^\circ$, $m\angle o = (5x - 40)^\circ$. Find the value of x .

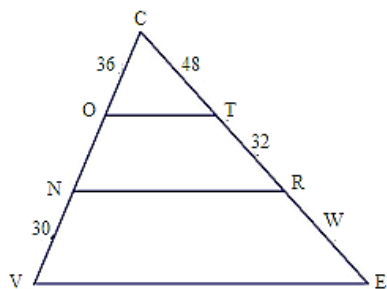


Challenge problems:

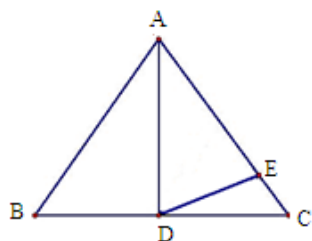
1. Each interior angle of a regular polygon is 171° . How many sides does the polygon have?

2. In trapezoid ABCD, sides AB and CD are parallel, and diagonal BD and side AD have equal length. If $m\angle DCB = 110^\circ$ and $m\angle CBD = 30^\circ$, then what is the $m\angle ADB = ?$

3. Solve for RE, given that $OT \parallel NR \parallel VE$, $CT = 48$, $TR = 32$, $CO = 36$, $NV = 30$.



4. In the figure, $\triangle ABC$ is equilateral, $\angle DAB = 30^\circ$, and $AE = AD$. Find $\angle EDC$.

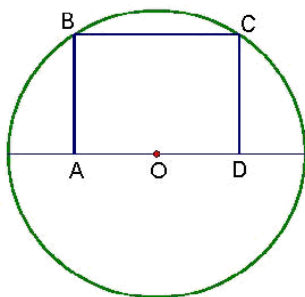


5. Isosceles right triangles are cut from the corners of a 9×9 square to form a regular octagon. What is the area of the remaining region (the octagon)?

6. The area of a rhombus is 300 square inches. The diagonals are in the ratio of 2:3. What is the length of a side of the rhombus in inches?

7. Circle K is inscribed in triangle EFG; $m \angle G = 90^\circ$. M is the point of tangency of EF. $EM = 3$ and $FM = 10$. What is the area of the triangle?

8. In the figure, O is the center of the circle and ABCD is a square. If the radius of the circle is 1, what is the area of the square?

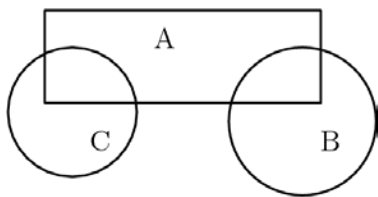


9. The legs of a right triangle are 20 and 21. Find the length of the median to the hypotenuse.

10. In triangle GAC, $GA = 12$ and $AC = 15$. The length of the altitude to AC is 6. How long is the altitude to GA?

11. In a $5 - 12 - 13$ triangle, what is the length of the bisector of the larger acute angle?

12. Three flower beds overlap as shown. Bed A had 70 plants, bed B has 50 plants, and bed C has 45 plants. Beds A and B share 15 plants, while beds A and C share 20. What is the total number of plants?



13. The sum of the squares of the lengths of all the sides of a rectangle is 72. Find the length of a diagonal of the rectangle.

14. $\triangle RST \cong \triangle DFE$. $\angle R = 50^\circ$, $\angle S = 90^\circ$, $\angle D = (x + 20)^\circ$, $\angle E = (y + 10)^\circ$, $\angle F = (z - 30)^\circ$. Find $x + y - z$.