First name: _____ Last name: _____ Student ID: _____

Geometry 3 Homework

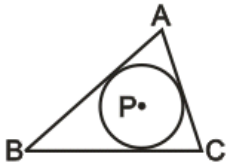
1. In ΔABC, $\overline{AD}$ is the perpendicular bisector of $\overline{BC}$ and D lies on $\overline{BC}$. Which statement(s) must be true?

(I) $\Delta ABD \cong \Delta ACD$ (II) ΔABC is equilateral. (III) $\overline{AD}$ is the bisector of $\angle BAC$.
a) III only b) I only c) I and III only d) II only e) I, II, and III

2. X is a point inside triangle ABC. If X is equidistant from $\overline{BC}$ and $\overline{AC}$, then X must lie on the
a) perpendicular bisector of $\overline{AB}$ b) bisector of $\angle C$ c) median of $\overline{BC}$
d) altitude to side $\overline{AB}$

3. The angle bisectors of ΔABC meet at point I, $\overline{AB} : \overline{BC} : \overline{CA} = 4:5:8$, and the area of ΔABC is 68. What is the area of ΔBCI?

4. In the figure, P is the incenter of ΔABC, the radius of the inscribed circle is 3 cm, and the perimeter of ΔABC is 42 cm. What is the area of ΔABC?



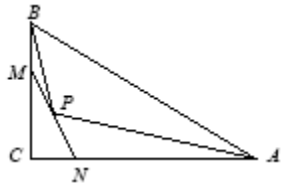
5. *ABCD* has perpendicular diagonals. If *AB* = 1 cm, *BC* = 4 cm, and *CD* = 8 cm, determine the number of centimeters in AD.

6. The radius and height of a cylinder are integers. If the total surface area is numerically equal to the volume, determine the largest possible number of units in the height of the cylinder.

7. Each side of a square has the same length as the diagonal of a 5" x 12" rectangle. A circle is inscribed in the square. Exactly how many inches are in the circumference of the circle?

8. In a 5-12-13 triangle, a segment is drawn parallel to the hypotenuse and 1/3 the way from the hypotenuse to the opposite vertex. Another segment is drawn parallel to the first and 1/3 the way from the previous segment to the opposite vertex. Determine the number of square units in the trapezoid whose bases are the two drawn segments.

9. In ΔABC , $AC = 8$, $BC = 6$, and $AB = 10$. If $\angle MNC = \angle ABC$ and P is the midpoint of MN, determine the length of MN so that the area of ΔBPA is half the area of ΔABC.



10. In ΔABC , BF bisects $\angle ABC$ and $\frac{BE}{EF} = \frac{BC}{BA}$. If $AB = 2$ and $BC = 3$, express the ratio $\frac{AE}{ED}$ in the form $\frac{a}{b}$ where a and b are relatively prime.