NAME _____

Project I: Grazing Area Project

A cow is secured by a 50 foot long rope that is tied to a stake. The stake is places 10 feet from the corner of a 20 foot by 40 foot barn. A line from the stake to the corner makes a 135° angle with the sides of the barn. Find how much grazing area the cow has.

Show complete work with diagram that can be followed through, for full credit.
Use a separate sheet of Paper.

Hint: Use a graphing paper and label some points

O: Center of circle stake.
G: Corner of barn nearest to the stake.
E: Corner of barn 20ft from G
F: Corner of barn, 40ft from G
N: 4th Corner of the Barn.
C: End of radius which passes through E.
D: End of radius which passes through F.
A: End of radius, so line AO|| line GE.
B: End of radius, so line BO|| line GF.
L: Intersection of ray GE and circle O.
M: Intersection of ray GF and circle O.
K: Intersection of line OA and ray FG.
J: Intersection of line OB and ray EG.
H: Intersection of circle E of radius equal to line EC, and line EN.
I: Intersection of circle F of radius equal to line FD, and line FN.

Find the following co-ordinates O, A, B, G, K, J, E, F.

Find Coordinates of C and D (you will use the equation of the lines OE and OF and Pythagorean Theorem to do this).

You have to find the following areas and add them

Total Area = OGE + OGF + CEH + IFD + COD.

Area under the Arc = $\dfrac{\pi r^2 \, mAB}{360}$.

Answer ~ 6931.37
The more decimal places you work with the more accurate your answer will be.