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| Assessment 5Dusty Wilson Math 254No work = no credit**No CAS Calculators** | **Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*The infinite! No other question has ever moved so profoundly the spirit of man.*David Hilbert1862 - 1943 (Prussian mathematician) |

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| Warm-ups (1 pt each): | Centroid of the unit circle (assuming uniform density) =\_\_\_\_ |  Expand  =\_\_\_\_\_ |

(1 pt) The quote by Hilbert (above) is from the author of our reading for this week. According to Hilbert, what is the most profound question ever asked? Answer using complete English sentences.

(10 pts) **Set up** (do not evaluate) an iterated integral that represents the mass of the lamina occupies the region bounded by  and  and has density . Hint: Should you want to check the mass is 8*k*.

(10 pts) **Set up** an iterated integral to represent the moment about the *x*-axis of the triangular region with vertices at (0,1), (1,2), and (4,1) and that has density function . Hint: Should you want to check the moment is 33.



(10 pts) Consider the lamina bounded by the semicircles  and  together with the portions of the *x*-axis that join them. The density of the lamina at a point is triple its distance from the origin. The mass of the lamina is . Find the centroid of the lamina.