

Name: Solution

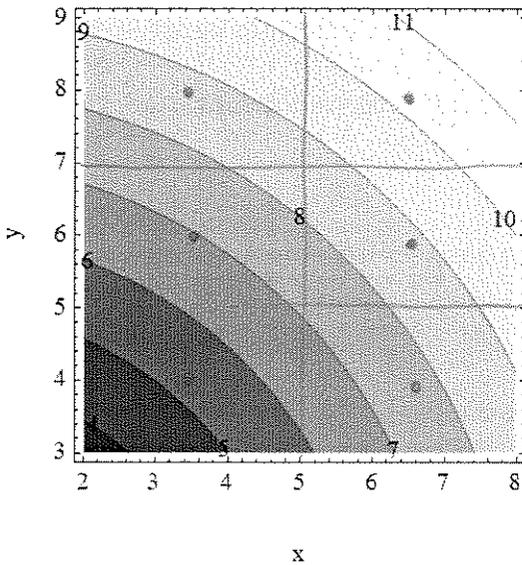
Hour: A

**Quiz 5: Multi-Variable Estimation**

Time: 15 Minutes	References: Basic Calculator, Ref. Sheet, and Text book	Based out of 100%
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1. The Naval Academy is constructing a new outdoor amphitheater along the banks of the Severn River. They have decided to build upwards instead of digging down. The diagram below shows what the final terrain will look like over the rectangle  $R=[2,8] \times [3,9]$ . All distances in meters.

Assuming the original terrain is perfectly flat at a height of 10 meters above the Severn River. Estimate how much dirt will they need to haul in and comment on the quality of your estimate? *Demonstrate process on plot by using 6 sub-regions.*



$10(36) = 360 \text{ m}^3 \leftarrow \text{original dirt}$   
 $\Delta A = 3(2) = 6$   
 $= 6(5.5 + 7 + 8.5 + 6.5 + 8 + 12.5)$   
 $= 276 \text{ m}^3 \leftarrow \text{dirt 2 end state}$

$\sum_{j=1}^3 \sum_{i=1}^2 f(\bar{x}_i, \bar{y}_j) \Delta x \Delta y$   
 haul in  $\Rightarrow 276 - 360 = -84 \text{ m}^3$  *actually have to haul away*

2. A young aspiring cadet mathematician recently modeled the cynicism in the Corps of Cadets based off how many years ( $t$ ) you have been a cadet versus your class rank ( $r$ ). She measures cynicism in sarcastic remarks per day.

Time/Rank	200	400	600	800	1000
1	3	4	9	11	13
2	6	7	12	16	21
3	8	13	17	26	35
4	5	11	33	76	99

Using the above table describe in a sentence what  $C(3,r) = 26$  means. (Hint: I am not looking for the actual value of  $r$ .)

What class rank would you have to be if you were in your third year and popping off 26 sarcastic remarks a day.

Answer = 800