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| Assessment 10Dusty Wilson Math 254 No work = no credit **No CAS Calculators** | **Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *When a philosopher says something that is true then it is trivial. When he says something that is not trivial then it is false.* Carl Friedrich Gauss 1777-1855 (German mathematician) |

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| Warm-ups (1 pt each): | =\_\_\_\_ | =\_\_\_\_\_ |

(1 pt) Based upon the quote (above) how much value did Gauss place in the work of philosophers? Please explain using complete English sentences.

(12 pts) Let . Use Stoke’s Theorem to show that the work done by  along **any** simple closed curve contained in the plane  is equal to zero.

Note: This requires math (10 pts) and writing to explain reasoning (2 pts).

(20 pts) Let *S* be the closed surface that has two parts: The bottom face *B* is the unit disc in the *xy*-plane. The upper surface *U* is the paraboloid . Let .

1. (10 pts) Find the flux of across *S* by using the Divergence (Gauss’) Theorem.

1. (10 pts) Calculate the flux of across *U.* (The answer is around 4.75)