Quiz #7

1. **(5 points)** Find the maximum and minimum values attained by the function:

$$f(x,y,z) = xy + 2z$$

when it is subject to the constraint: $x^2 + y^2 + z^2 = 36$. Show all of your work. Record your final answers in the spaces provided on the next page.

ADDITIONAL SPACE TO SHOW YOUR WORK IS GIVEN ON THE NEXT PAGE.

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$$f(x,y,z) = xy + 2z$$

when it is subject to the constraint: $x^2 + y^2 + z^2 = 36$. Show all of your work. Record your final answers in the space provided at the bottom of this page.

MAXIMUM value attained by $f(x, y, z)$ = _____

MINIMUM value attained by $f(x, y, z)$ = _____

2. **(5 points)** A snake (on a plane) has found a warm metal plate to slither around on. The temperature of the plate (given in ºC) at a point (x and y are both measured in meters) is given by the function:

$$T(x,y) = 4x^2 - 4xy + y^2.$$

The snake slithers around in a path that looks exactly like a circle of radius 5 meters centered on the origin. What are the highest and lowest temperatures encountered by the snake as it slithers around this circular path? Show your work and record your answers in the spaces provided on the last page of the quiz.

ADDITIONAL SPACE TO SHOW YOUR WORK IS GIVEN ON THE NEXT PAGE.

ADDITIONAL SPACE TO SHOW YOUR WORK FOR PROBLEM 2.

A snake (on a plane) has found a warm metal plate to slither around on. The temperature of the plate (given in °C) at a point (x and y are both measured in meters) is given by the function:

$$T(x,y) = 4x^2 - 4xy + y^2.$$

The snake slithers around in a path that looks exactly like a circle of radius 5 meters centered on the origin. What are the highest and lowest temperatures encountered by the snake as it slithers around this circular path? Show your work and record your answers in the spaces provided below.

THE **HIGHEST** TEMPERATURE ENCOUNTERED BY THIS %+$*/^%!@ING SNAKE WAS:

^{O}C

_____

THE **LOWEST** TEMPERATURE ENCOUNTERED BY THIS %+$*/^%!@ING SNAKE WAS:

^{O}C

_____