

Quiz 6

Key

This is a two-stage quiz. During the first stage, use your knowledge & calculator. You have 15 min. In the second stage, you are now welcome to use your books, notes, and students in the class to retake the same quiz. You have the remainder of the quiz time to write one solution (with everyone's name on it!!!) to be turned in for the group.

- The wind-chill index W is the perceived temperature when the actual temperature is T and the wind speed is v , so we can write $W = f(T, v)$. The table below provides some values for W as a function of T and v .

		Wind speed (km/h)					
Actual temperature (°C)	$T \backslash v$	20	30	40	50	60	70
	-10	-18	-20	-21	-22	-23	-23
	-15	-24	-26	-27	-29	-30	-30
	-20	-30	-33	-34	-35	-36	-37
	-25	-37	-39	-41	-42	-43	-44

table reading 1.5 (a) [2] Approximate $f_T(-25, 30)$ very T
 $\frac{1}{4.1} \approx 0.28$
 $(1.5) \left\{ \frac{6}{5} \approx \frac{-39 - (-33)}{-25 - (-20)} = \frac{-6}{-5} = \frac{6}{5} \right.$
 Linearization 1.5
 Start 1.5
 (b) [4] Find a local linearization for f that could be used when T is near -30°C and v is near 32 km/hr .

1.5 { Looking for $z - z_0 = m_T(T - T_0) + m_v(v - v_0)$

1.5 { $T = 30$ and $v = 32$ is close to $T = -25$ and $v = 30$ so we'll use $(-25, 30, -39)$

1.5 { $m_T \approx \frac{6}{5}$ from (a)

1.5 { $m_v = \frac{\partial W}{\partial v} \approx \frac{-41 - (-39)}{40 - 30} = \frac{-2}{10} = -\frac{1}{5}$

So $z - (-39) = \frac{6}{5}(T - (-25)) - \frac{1}{5}(v - 30)$

- Consider a function g whose contour lines are shown below

- [1] Estimate a local minimum.

Webhw 4.7. #2
 $(1, 1)$ looks like a local min.
 value is ≈ 3

- [2] Sketch the direction of $\nabla g(1, 0)$.

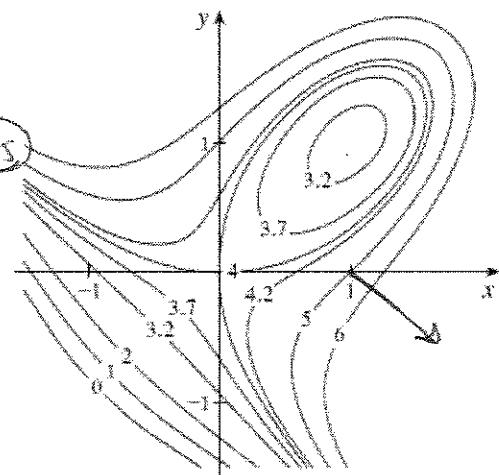
#4.6 #26

1.5 steepest increase

- [1] Let $\vec{u} = \langle \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \rangle$.

Find a point (c, d) where $D_{\vec{u}}g(c, d) > 0$

ex for class



1.5 { want a place where function increases as we move down & to right.

Note (b) works

just use 1.5