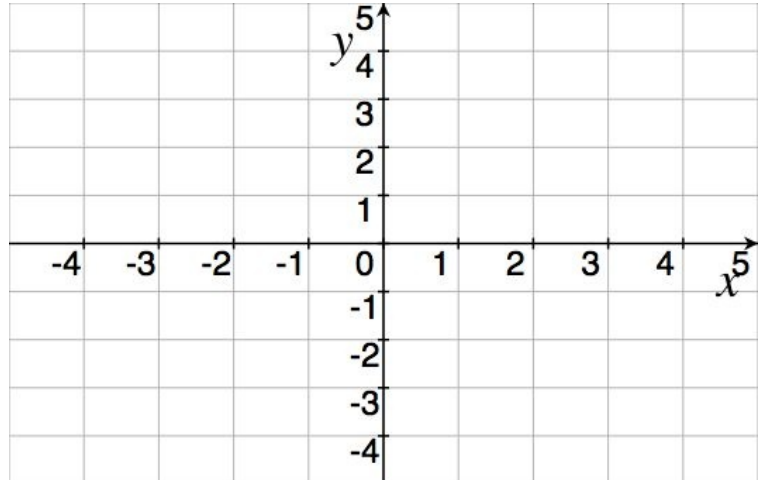# TMATH 124: Quiz 8

Reasonable supporting work must be shown to earn credit.

1. [5] Sketch the graph of a function f that satisfies *all* of the following.

   (a) f is continuous on $[-3, 4]$

   (b) $x = 2$ is a maximum

   (c) $f'(2)$ does not exist

   (d) $f'(-2) = 0$

   (e) $x = -2$ is *not* a maximum or minimum

2. A sprinkler is constructed in such a way that $\frac{d\theta}{dt}$ is constant, where θ ranges between $45°$ to $135°$. The distance the water travels horizontally is $x = \dfrac{v^2 \sin(2\theta)}{32}$ where v is the speed of the water that is held constant.

   (a) [1] Describe what $\frac{d\theta}{dt}$ is, consider providing the units in the explanation.
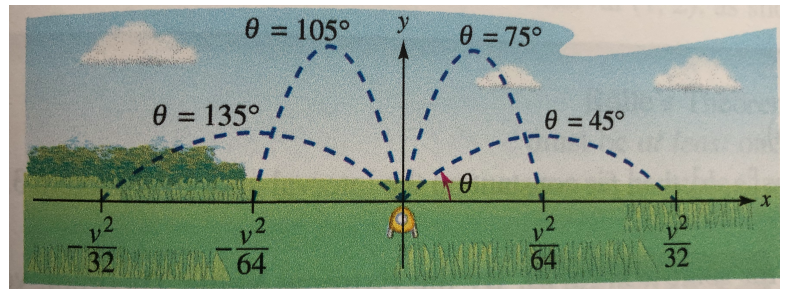
   (b) [1] What part of the lawn receives the least about of water?

   (c) [3] Explain & justify your answer above analytically.