Math 254 CLASS EXERCISES **4 May 2018**

The pressure in kilopascals (kPa) at the point (x, y, z), each in feet, is given by a function $P(x, y, z)$. It is known that

$$P(3, 1, 2) = 1031, \qquad P_x(3, 1, 2) = -1.3$$

$$P_y(3, 1, 2) = 0.8, \qquad P_z(3, 1, 2) = 2.4$$

1. What are the units for $P_x(3, 1, 2) = -1.3$? Write a sentence interpreting $P_x(3, 1, 2) = -1.3$.

2. Using the given information, you should be able to approximate the value of $P(5, 4, 3)$. Do so.

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3. Give a vector in the direction of greatest rate of decrease of the function.

4. Give a vector in a direction of no change in the function.

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5. Give the greatest rate of increase of the function.

6. Give the rate of change of the function in the direction of $\vec{\mathbf{v}} = \langle 1, -3, 2 \rangle$.