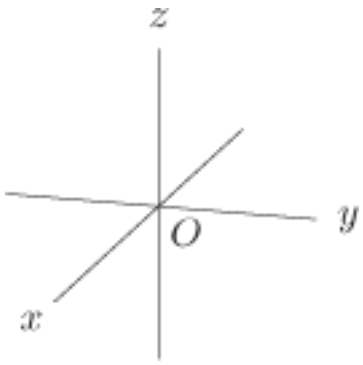
12.1 Functions of Several Variables

Name: Date:

P 2. Which two of the three points $P_1 = (1, 2, 3)$, $P_2 = (3, 2, 1)$ and $P_3 = (1, 1, 0)$ are closest to each other?

P 4. You are at the point $(3, 1, 1)$, standing upright and facing yz-plane. You walk 2 units forward, turn left, and walk another 2 units. What is your final position? From the point of view of an observer looking at the coordinate system below, are you in front of or behind the yz-plane? To the left or to the right of the xz-plane? Above or below the xy-plane?



P 21. The temperature adjusted for wind chill is a temperature which tells you how cold it feels, as a result of the combination of wind and temperature.

Wind Speed (mph) \ Temperature (°F)	35	30	25	20	15	10	5	0
5	31	25	19	13	7	1	–5	–11
10	27	21	15	9	3	–4	–10	–16
15	25	19	13	6	0	–7	–13	–19
20	24	17	11	4	–2	–9	–15	–22
25	23	16	9	3	–4	–11	–17	–24

(a) If the temperature is 0° F and the wind is 15 mph, how cold does it feel?

(b) If the temperature is 35° F, what wind speed makes it feel like 24° F?

(c) If the temperature is 25° F, what wind speed makes it feel like 12° F?

(d) If the wind is blowing at 20 mph, what temperature feels like 0° F?

P 22. Use the table in problem 21 to make a table with the the temperature adjusted for wind chill as a function of wind speed for temperatures 20° F and 0° F.

P 44. Determine if the statement is true or false and justify your answer. "If $f(x, y)$ is a function of two variables defined for all x and y, then $f(10, y)$ is a function of one variable."

P 45. Determine if the statement is true or false and justify your answer. "The volume V of a box of height h and square base of side length s is a function of h and s."

P 46. Determine if the statement is true or false and justify your answer. "If $H = f(t, d)$ is the function giving the water temperature H° C of a lake at time t hours after midnight and depth d meters, then t is a function of d and H."

P 47. Determine if the statement is true or false and justify your answer. "A table for a function $f(x, y)$ cannot have any values of f appearing twice."