MAT 211  Quiz 2

Place **ANSWERS ONLY** in the boxes.

1) Use a Box to graph the point \((3, 2, 4)\) on the graph to the **left** below.
2) Use a Box to graph the point \((-5, 3, -4)\) on the graph to the **right** below.

\[
z = F(x, y) \text{ is graphed below (with level curves). Use the graph to answer problems 3 through 8.}
\]

3) \(F(4, 3) = \)

4) Find all (showing) solutions to the equation \(F(-5, y) = 2\)

5) Find all (showing) solutions to the equation \(F(x, 3) = 1\)

6) Starting at the point \((0, 7)\), if the value of \(x\) remains constant and \(y\) is increasing, what appears to be happening to the value of \(z\)?

7) Starting at the point \((2, 3)\), is the graph of \(F(x, y)\) steeper to the left or to the right?

For each of the following, write “+” if the value appears to be positive, “−” if it appears to be negative, or “0” if it appears to be zero.

8) \(F_x(-7, 3) = \)

9) \(F_y(-7, 3) = \)

10) \(F_x(3, 8) = \)

11) \(F_y(2, 3) = \)
12) Using the plane on the left, given \( z = \frac{4 + x - y}{2} \), draw level curves when \( z = 0, 1, 2, \) and 3. Label the results.

13) Using the plane on the right, given \( z = \sqrt{x^2 + y^2} \), draw level curves when \( z = 0, 1, 2, \) and 3. Label the results.

14) A sphere is given by the equation \((x - 5)^2 + (y + 8)^2 + z^2 = 3\).
   a) Find the center.
   b) Find the radius.

15) Find the standard form of the equation of the sphere with radius 9 and a center \((2, 0, -9)\).

16) When a company makes and sells \( x \) units of product A and \( y \) units of product B, their profit is given by the function \( P(x, y) = 3500x - y^2 + 600y - 96000y - 15000 \). Assume that the company is now making 100 units of product A and 225 units of product B.
   a) What is the company’s current profit?
   b) Find \( P_x(100, 225) \).
   c) Find \( P_y(100, 225) \).
   d) Assuming that they wish to increase profit, should the company produce more units of product A? (Yes or No)
   e) Assuming that they wish to increase profit, should the company produce more units of product B? (Yes or No)