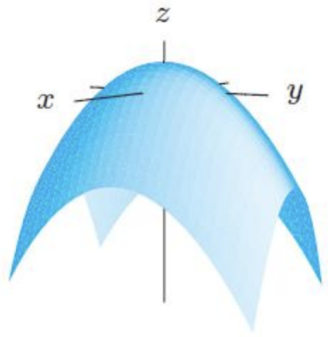
Class Worksheet 2/1/22

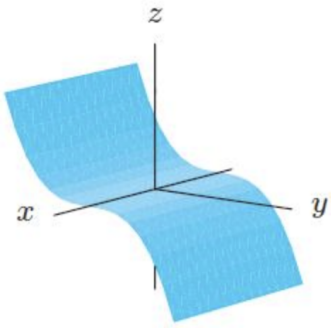
Example 1:

Match the surfaces (a)-(e) with the contour diagrams (I) -(IV)

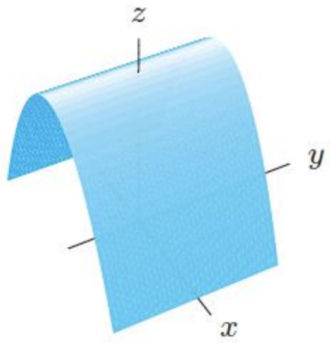
(a)



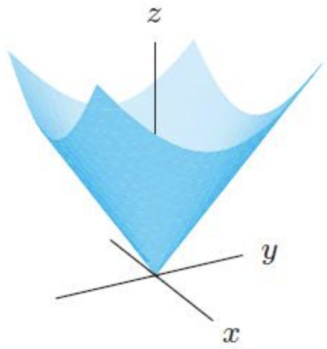
(b)



(c)



(d)



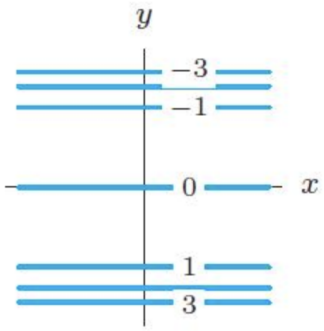
(a) corresponds to (III).

(b) corresponds to (I).

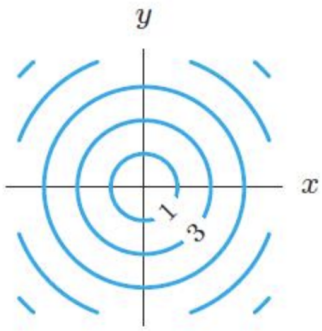
(c) corresponds to (IV)

(d) corresponds to (II).

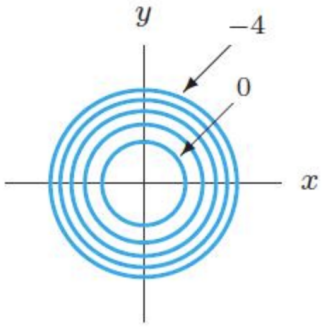
(I)



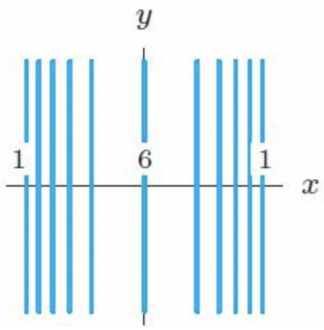
(II)



(III)



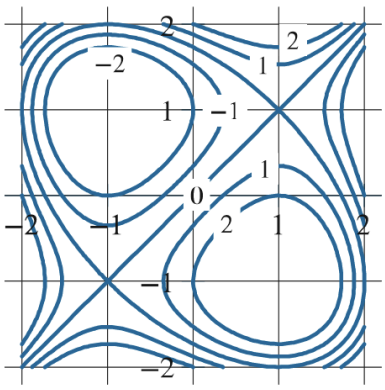
(IV)



Example 2:

The figure below shows the contour diagram of $z = f(x, y)$. Which of the points $A = (1, 0, 2)$, $B = (1, 1, 1)$, $C = (0, -1, -2)$, $D = (-1, 0, -2)$ lie on the graph of $z = f(x, y)$?

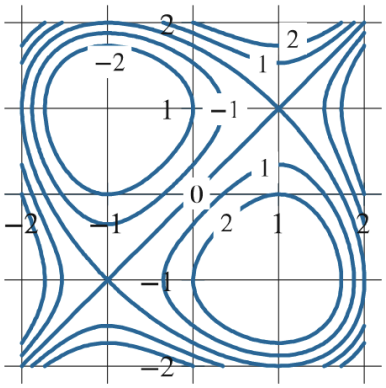
NOTE: Select all that apply.



☐ A ☐ B ☐ C ☐ D

Solution:

In terms of contours, a point (a, b, c) lies on the graph of $z = f(x, y)$ if the contour $z = c$ passes through the point (a, b), so we test each point.



$A = (1, 0, 2)$: The 2 contour passes through the point $(1, 0)$, so point $A = (1, 0, 2)$ lies on the graph of $z = f(x, y)$.

$B = (1, 1, 1)$: The 0 contour passes through the point $(1, 1)$, so point $B = (1, 1, 1)$ does not lie on the graph of $z = f(x, y)$.

$C = (0, -1, -2)$: The 2 contour passes through the point $(0, -1)$, so point $C = (0, -1, -2)$ does not lie on the graph of $z = f(x, y)$.

$D = (-1, 0, -2)$: The -2 contour passes through the point $(-1, 0)$, so point $D = (-1, 0, -2)$ lies on the graph of $z = f(x, y)$.