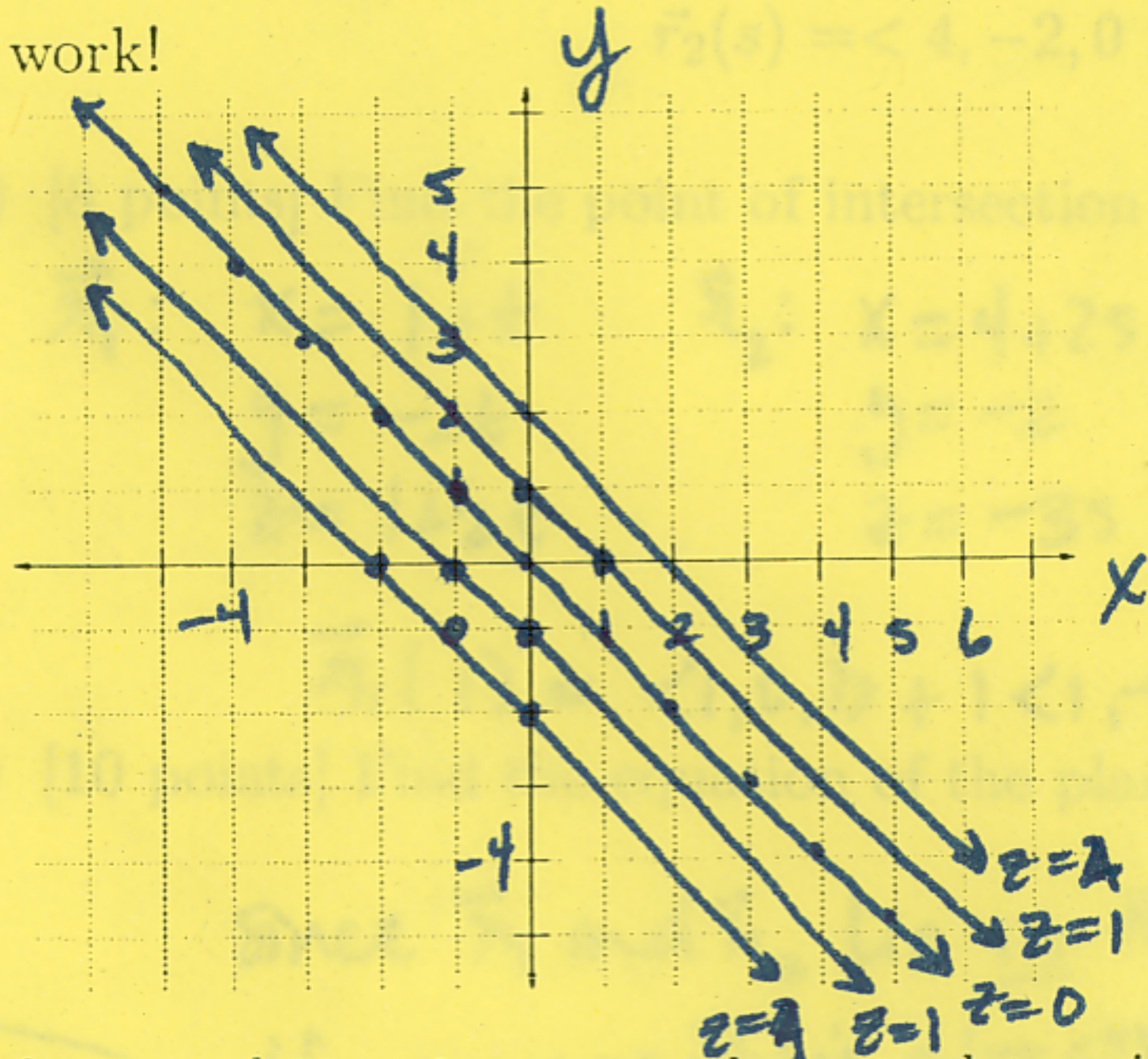


3. Let $z = (x + y)^2$.

(a) [15 points] Sketch at least 3 different z -traces below. Be sure to label the axes and mark important values on the axes to indicate the scale you've chosen. Show your work!



z -traces \Rightarrow fix z .

$$z=0: 0 = (x+y)^2 \Rightarrow 0 = x+y \Rightarrow y = -x$$

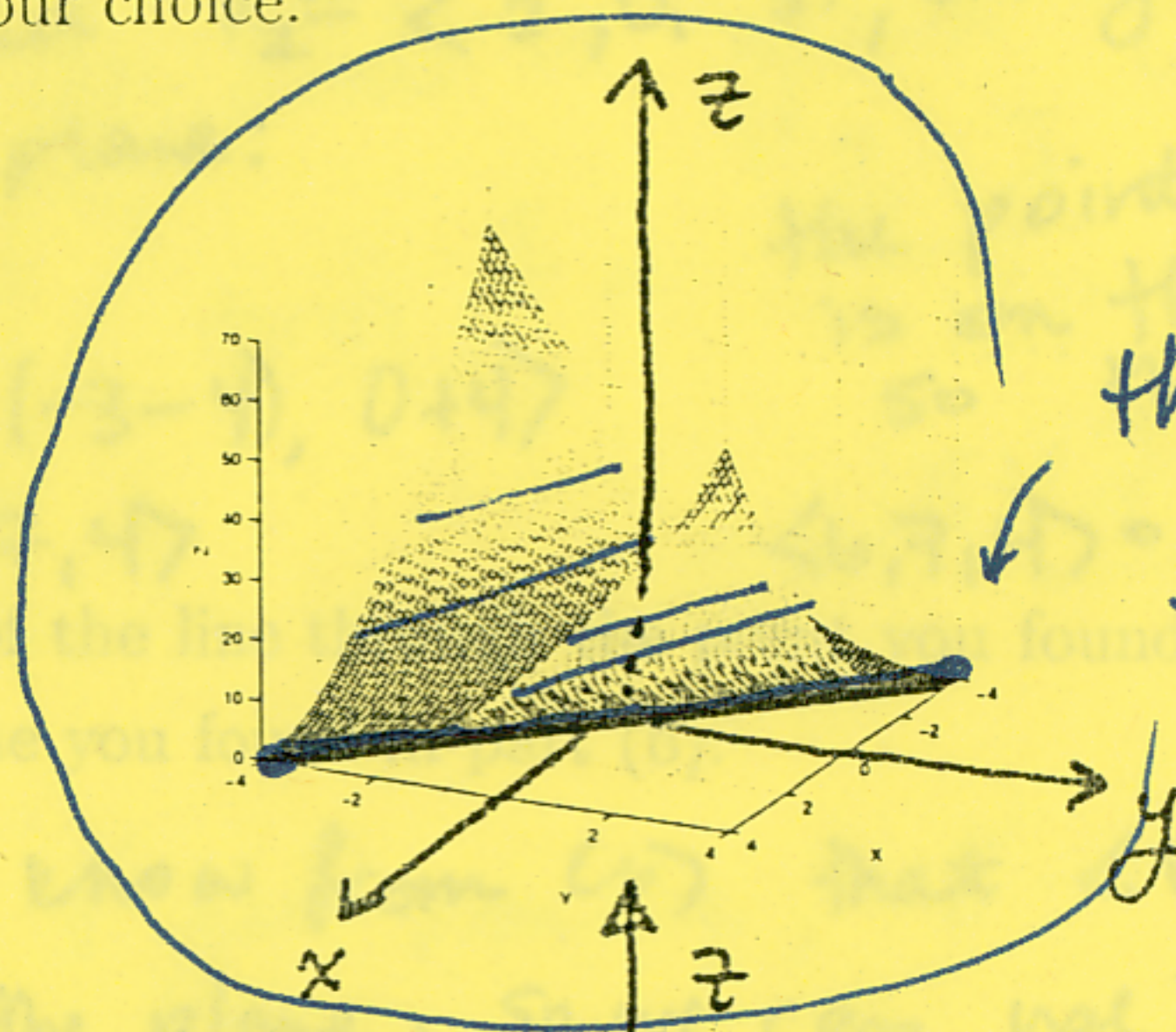
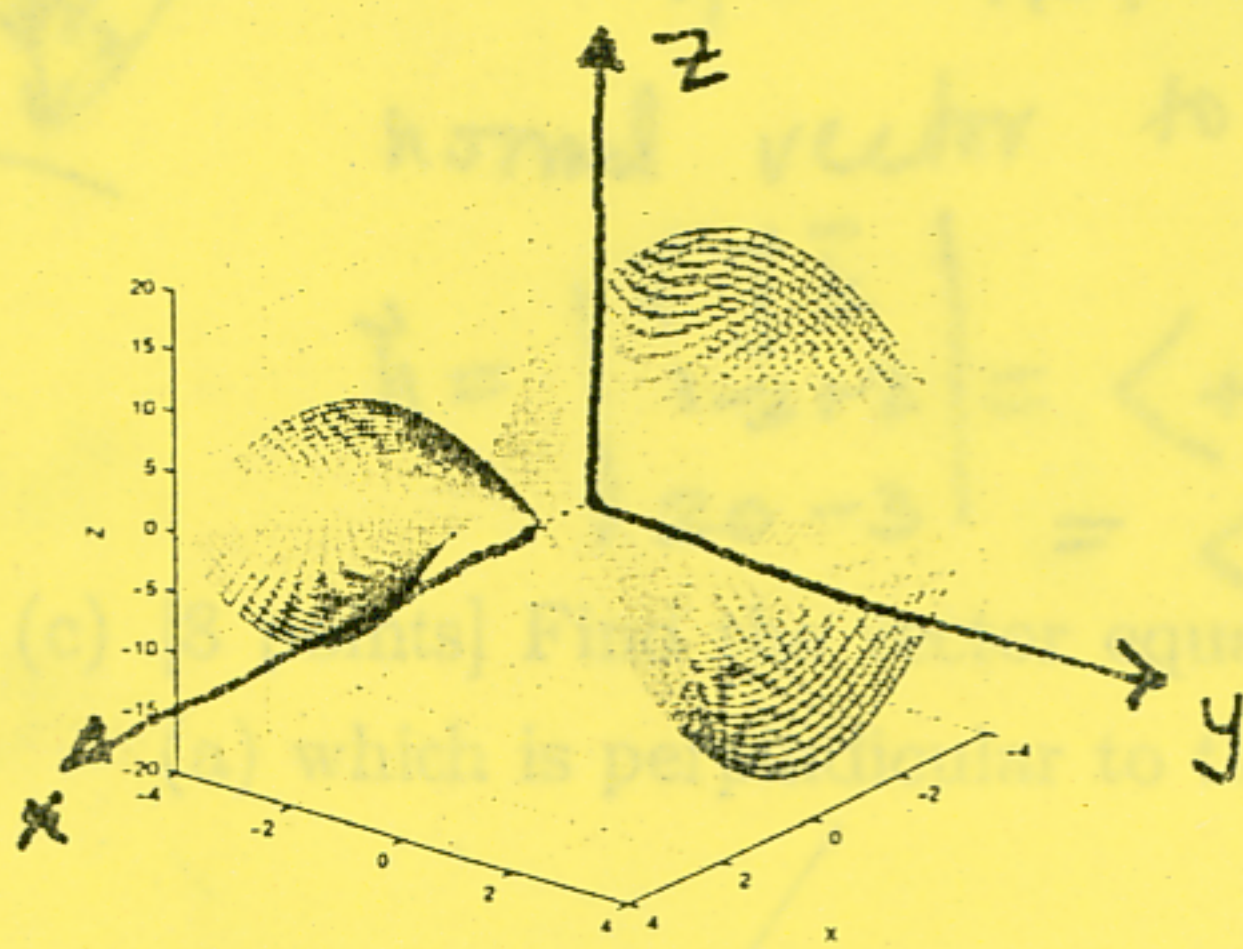
$$z=1: 1 = (x+y)^2 \Rightarrow \pm\sqrt{1} = x+y \Rightarrow \pm 1 = x+y$$

so $y = -x - 1$ or $y = -x + 1$

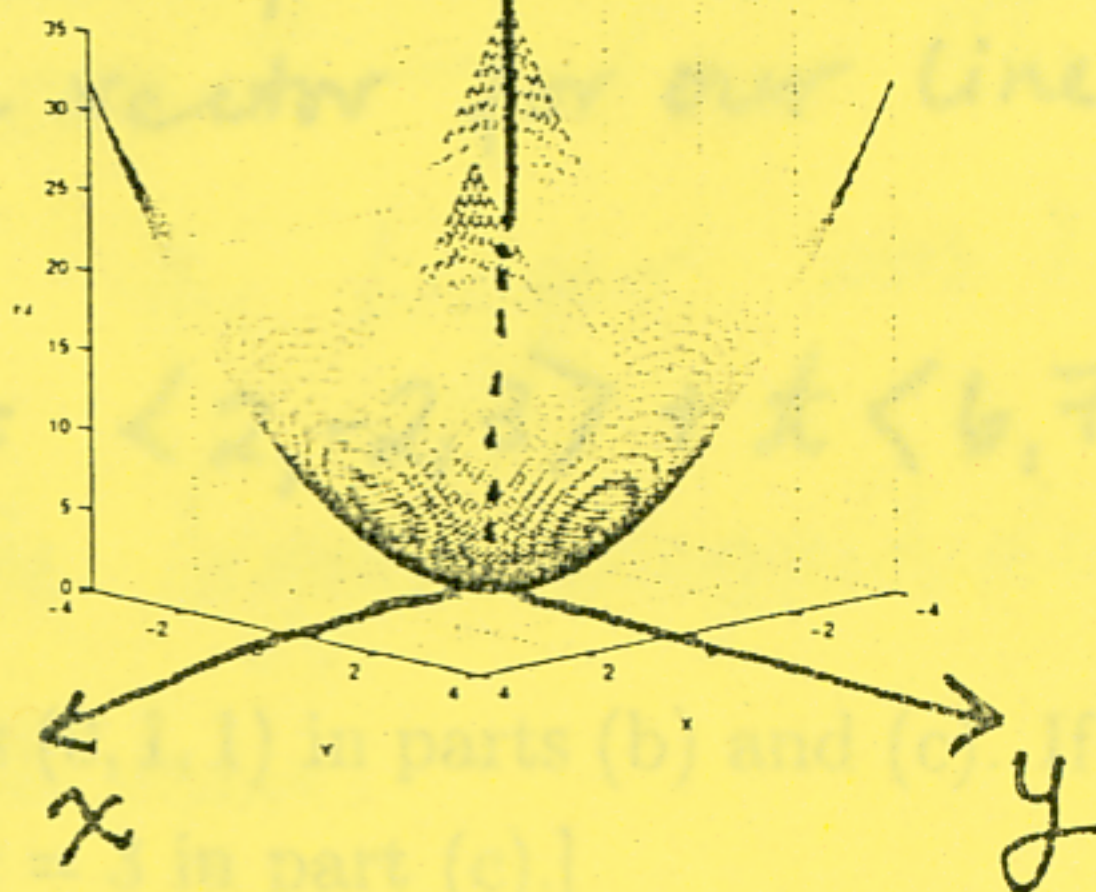
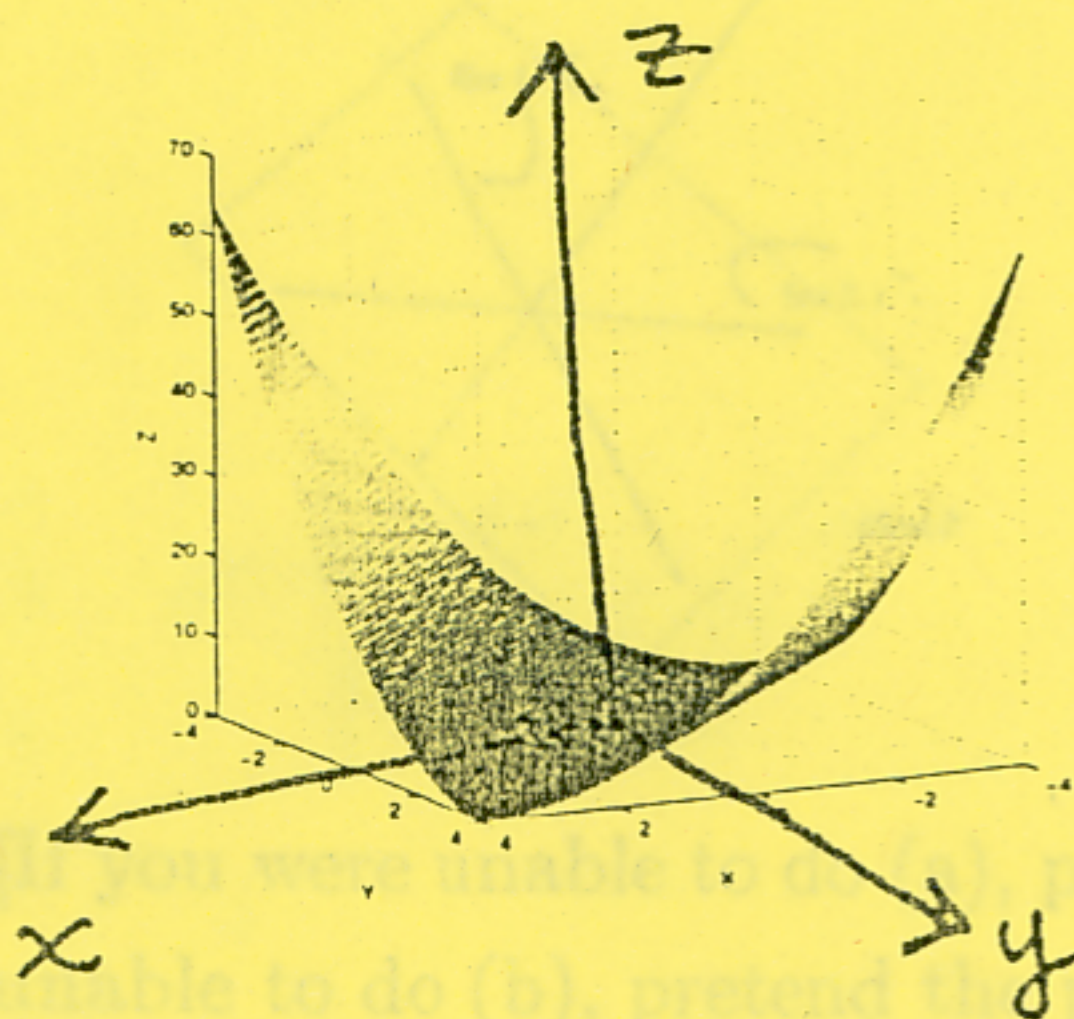
$$z=4: 4 = (x+y)^2 \Rightarrow \pm 2 = x+y \Rightarrow y = -x \pm 2$$

$\Rightarrow y = -x + 2$ or $y = -x - 2$

(b) [8 points] Use the traces above to determine which is the graph of the given equation, and circle the correct one. Explain your choice.



this is the only graph that has both z -traces that are lines AND $z=0$ for $y=x$.



$$z=1: \begin{array}{c|c} x & y \\ \hline 0 & 1 \\ 1 & 0 \end{array}$$

$$z=4: \begin{array}{c|c} x & y \\ \hline 0 & -2 \\ -1 & -1 \end{array}$$

$$z=1: \begin{array}{c|c} x & y \\ \hline 0 & -1 \\ -1 & 0 \end{array}$$

$$z=4: \begin{array}{c|c} x & y \\ \hline 0 & -2 \\ -1 & -1 \end{array}$$