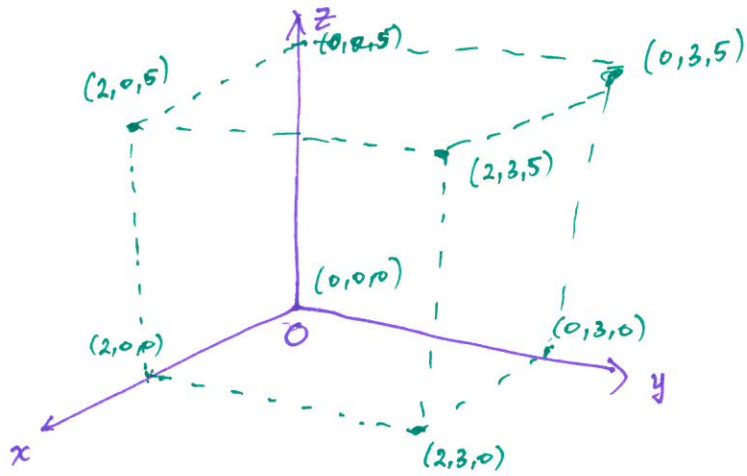


SECTION 12.1 (3, 4, 6, 15, 23, 29, 30, 36)

3. C is closest to the  $yz$  plane because it has the smallest absolute value of the  $x$ -coordinate. The point  $A(-4, 0, -1)$  lies on the  $xz$  plane so the distance from  $A$  to the  $xz$  plane is zero.

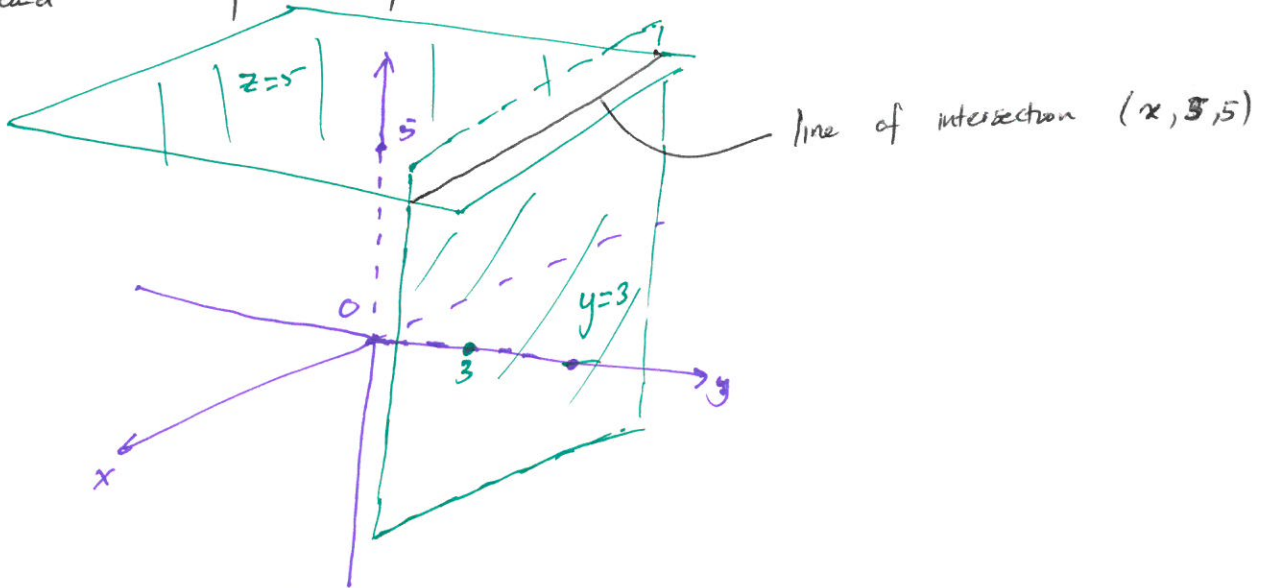
4.



- The projection of  $(2, 3, 5)$  onto the  $xy$  plane is  $(2, 3, 0)$   
 - onto  $yz$  plane  $\Rightarrow (0, 3, 5)$   
 onto  $xz$  plane  $\Rightarrow (2, 0, 5)$

length of diagonal =  $\sqrt{38}$ . (use the distance formula!)

6.  $y=3$  is a vertical plane parallel to the  $xz$  plane (3 units to the right of it)  
 $z=5$  is a horizontal plane parallel to the  $xy$  plane (5 units above it)  
 $y=3$  and  $z=5$  represents points that are on both ( $y=3$  and  $z=5$  planes)



15.  $(x-3)^2 + (y-8)^2 + (z-1)^2 = 30$

23 (a)  $(x-2)^2 + (y+3)^2 + (z-6)^2 = 36$

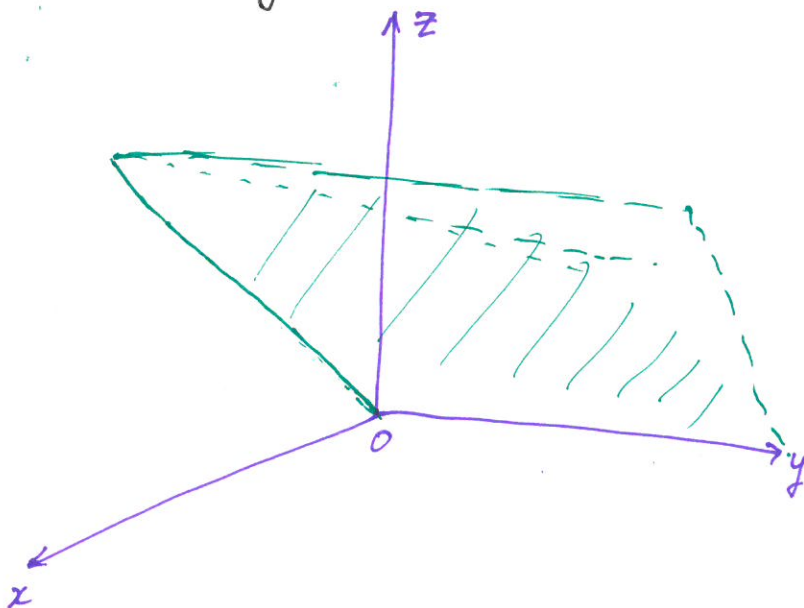
(b)  $(x-2)^2 + (y+3)^2 + (z-6)^2 = 4$

(c)  $(x-2)^2 + (y+3)^2 + (z-6)^2 = 9$

29.  $0 \leq z \leq 6$  is the region between the planes  $z=0$  and  $z=6$ .

30.  $y^2 = 4 \Leftrightarrow y = \pm 2$  represents 2 vertical planes parallel to the  $xz$ -plane  
(2 units to the left and right of it)

31.  $x=z$  is a plane perpendicular to the  $xz$  plane intersecting the  $xz$  plane  
along the line  $x=z, y=0$ .



Notes:

1. In general all axes must be labelled
2. Draw large clear diagrams.