

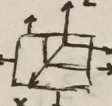
Lyell C Read

CH 11.2 Homework  
pr. 1-50

9/25/2018

1) Head (from  $O(0,0,0)$ ) 3 units in the (+) x direction then 2 in the (-) y direction, and 1 in the (+) z direction.

2) The y-coordinate of all points in the xz plane is 0

3)  all x-coords are 4, it's a shifted yz plane that's 4 in the (+) x direction

4)  $A(3,5,-2)$   $B(0,-6,3)$   $\vec{AB} = \langle -3, -11, 5 \rangle$

5)  $U = \langle 3, 5, -7 \rangle$   $V = \langle 6, -5, 1 \rangle$   $U+V = \langle 9, 0, -6 \rangle$   
 $3U = \langle 9, 15, -21 \rangle$   $-V = \langle -6, 5, -1 \rangle$   $3U-V = \langle 3, 20, -22 \rangle$

6)  $P(x_1, x_2, x_3)$   $Q(y_1, y_2, y_3)$   $\vec{PQ} = \langle y_1 - x_1, y_2 - x_2, y_3 - x_3 \rangle$

$$|\vec{PQ}| = \sqrt{(y_1 - x_1)^2 + (y_2 - x_2)^2 + (y_3 - x_3)^2}$$

7) Distance from  $O$  is same as magnitude.

$$|\vec{OP}_2| = 4$$

$O = (0,0,0)$   $P_1 = (3,-1,2)$   $P_2 = (0,0,-4)$

$$|\vec{OP}_1| = \sqrt{14}$$

$$|\vec{OP}_1| = \sqrt{3^2 + 1^2 + 2^2}$$

$$|\vec{OP}_2| = \sqrt{4^2}$$

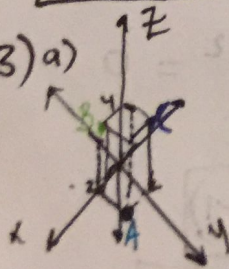
$P_2$  is further

8) [only working out the novel part] Vector:  $\vec{PQ} = \langle x_1, x_2, x_3 \rangle$

$$\vec{PQ} = x_1\mathbf{i} + x_2\mathbf{j} + x_3\mathbf{k}$$

9)  $A = (3,0,5)$   $B = (3,4,0)$   $C = (0,4,5)$

13) a)



$P = (2,2,4)$

b) [11]

$A = (x,y,0) = (2,2,0)$

c) [11]

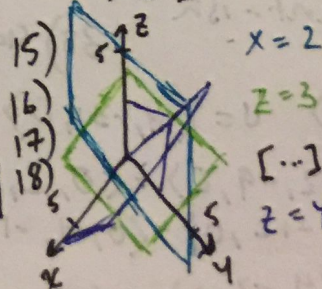
$B = (x,0,z) = (2,0,4)$

(4,15) [11]

$C = (0,y,z) = (0,2,4)$

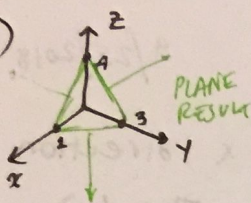
10) [REDUANT] 11) [11]

12) [11]

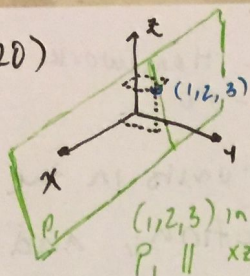




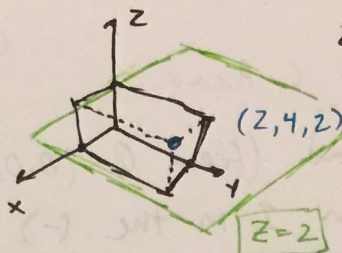
19)



20)



21)



22) [11]

23) Center:  $(1, 2, 3)$   $r=4$

$$(x-1)^2 + (y-2)^2 + (z-3)^2 = 16$$

25) Center  $(-2, 0, 4)$   $r=1$  Ball

$$(x+2)^2 + y^2 + (z-4)^2 \leq 1$$

24) Center:  $(1, 2, 0)$  thru  $(3, 4, 5)$

$$\sqrt{(3-1)^2 + (4-2)^2 + (5-0)^2}$$

$$\sqrt{4 + 4 + 25} = \sqrt{33}$$

$$(x-1)^2 + (y-2)^2 + z^2 = 33$$

26) [11]

27) points:  $P(1, 0, 5)$   $Q(2, 3, 9)$  midpoint of  $PQ$   $\left(\frac{1+2}{2}, \frac{0+3}{2}, \frac{5+9}{2}\right)$

$$r = \frac{\sqrt{(2-1)^2 + 3^2 + 9-5^2}}{2} = \frac{\sqrt{26}}{2}$$

$$= (1.5, 1.5, 7)$$

$$(x-1.5)^2 + (y-1.5)^2 + (z-7)^2 = \frac{13}{2}$$

28) [11]

29)  $(x-1)^2 + y^2 + z^2 = 9$   
Circle with center:  
 $(1, 0, 0)$  Rad: 3

31)  $x^2 + y^2 + z^2 - 2y - 4z - 4 = 0$   
 $x^2 + y^2 - 2y + z^2 - 4z = 4$

$$\frac{x^2}{1} + \frac{(y^2 - 2y + 1)}{1} + \frac{(z^2 - 4z + 4)}{1} = 4 + 1 + 4$$

$$\frac{x^2}{1} + \frac{(y-1)^2}{1} + \frac{(z-2)^2}{1} = 9$$

$$x^2 + y^2 - 2y + z^2 - 4z = 4$$

$$x^2 + (y^2 - 2y + 1) + (z^2 - 4z + 4) = 4 + 1 + 4$$

$$x^2 + (y-1)^2 + (z-2)^2 = 9$$

Center:  $(0, 1, 2)$   $r=3$

37)  $x^2 - 2x + y^2 + 6y + z^2 + 10 = 0$

$$(x^2 - 2x + 1) + (y^2 + 6y + 9) + z^2 = -10$$

$$(x-1)^2 + (y+3)^2 + z^2 = 0$$

Point at  $(1, -3, 0)$

a)  $3u + 2v = \langle 12, -9, 0 \rangle + \langle 0, 2, 2 \rangle = \langle 12, -7, 2 \rangle$

b)  $4u - v = \langle 16, -12, 0 \rangle + \langle 0, -1, -1 \rangle = \langle 16, -13, -1 \rangle$

c)  $|u + 3v| = |\langle 4, -3, 0 \rangle + \langle 0, 3, 3 \rangle| = |\langle 4, 0, 3 \rangle| = \sqrt{16 + 9} = 5$



40-44) SKIPPED 45)  $P = (1, 5, 0)$   $Q = (3, 11, 2)$

a)  $\vec{PQ} : \langle 2, 6, 2 \rangle = 2i + 6j + 2k$  NEG. U.V:  $\langle -\frac{2}{\sqrt{44}}, -\frac{6}{\sqrt{44}}, -\frac{2}{\sqrt{44}} \rangle$

b)  $|\vec{PQ}| : \sqrt{4 + 36 + 4} = \sqrt{44}$

c) 2 UV  $\parallel \vec{PQ}$  unit vector formed by:  $\frac{\vec{PQ}}{|\vec{PQ}|} = \langle \frac{2}{\sqrt{44}}, \frac{6}{\sqrt{44}}, \frac{2}{\sqrt{44}} \rangle$

46-50) SAME AS 45.