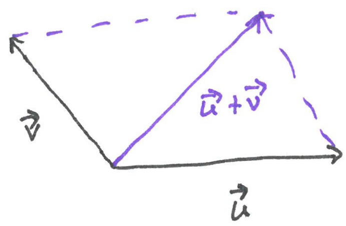
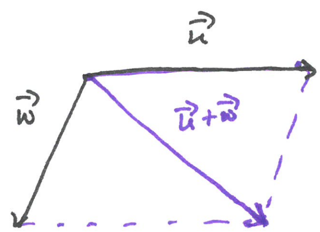
Section 12.2

4(a) $\overrightarrow{AC}$ (b) $\overrightarrow{CB}$ (c) $\overrightarrow{DA}$ (d) $\overrightarrow{DB}$

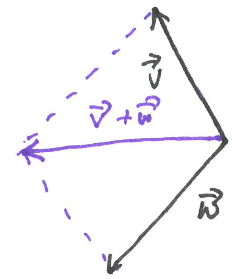
5(a)



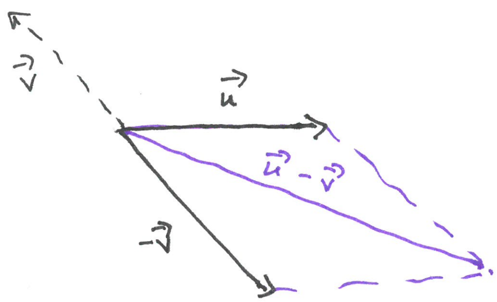
5(b)



5(c)

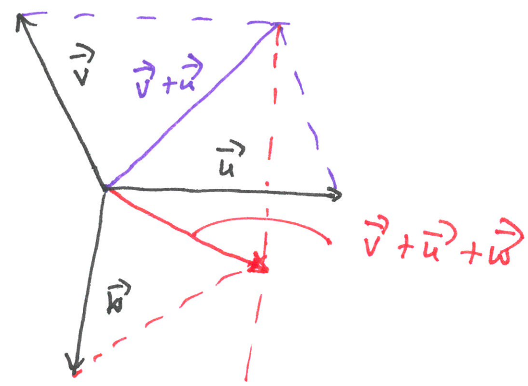


5(d) $\vec{u}-\vec{v} = \vec{u}+(-\vec{v})$



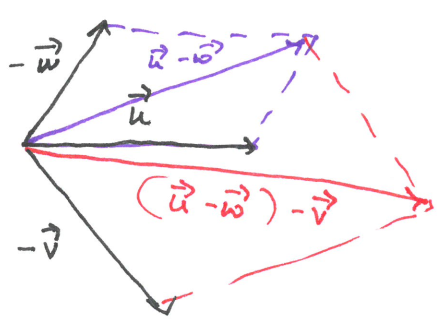
5(e) $\vec{v}+\vec{u}+\vec{w}$

$= (\vec{v}+\vec{u})+\vec{w}$

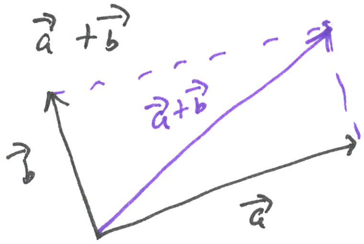


5(f) $\vec{u}-\vec{w}-\vec{v}$

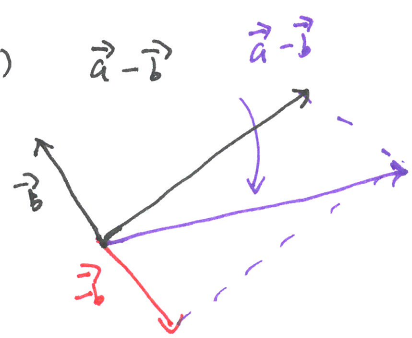
$= (\vec{u}-\vec{w})-\vec{v}$



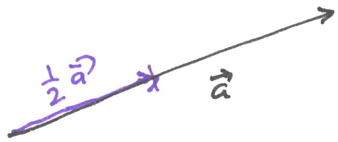
6(a) $\vec{a}+\vec{b}$



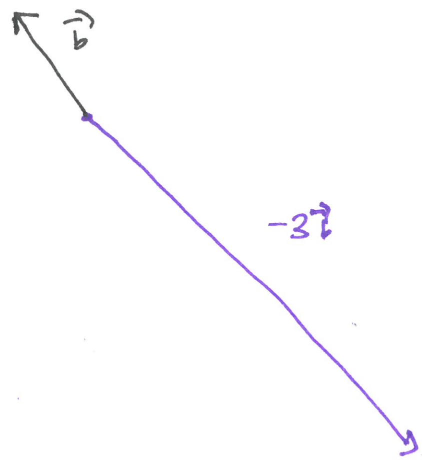
6(b) $\vec{a}-\vec{b}$



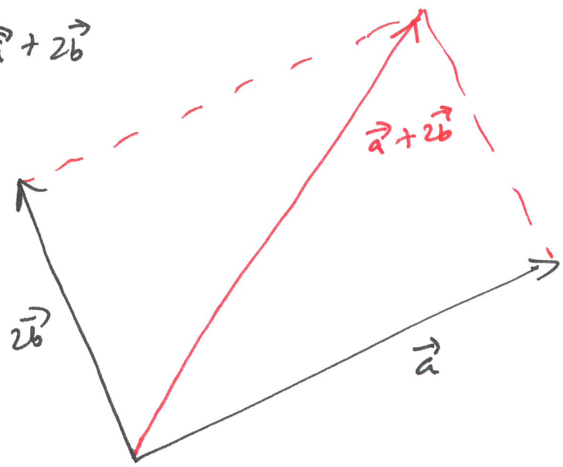
6(c)



6(d)

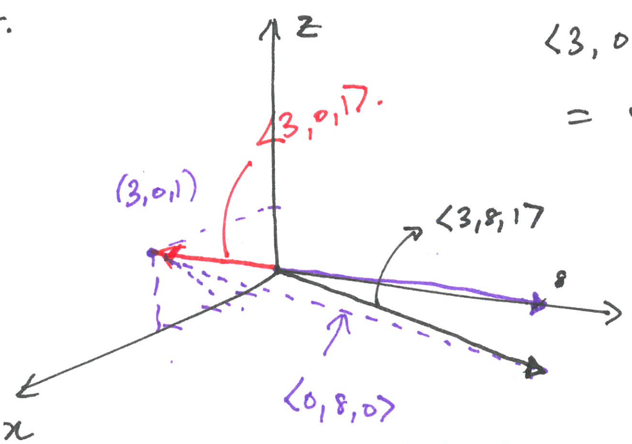


6(e) $\vec{a} + 2\vec{b}$



13. See worksheet solution (Problem 4)

17.



$\langle 3,0,1\rangle + \langle 0,8,0\rangle$

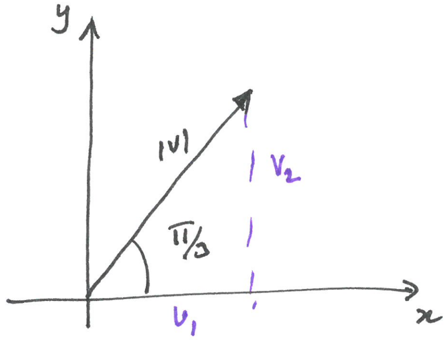
$= \langle 3,8,1\rangle$

It is easier to sketch the resulting vector if we move $\langle 0,8,0\rangle$ so that it starts at the tip of $\langle 3,0,1\rangle$

25. $\frac{1}{9}(8i - j + 4k)$

26. $4 \cdot \frac{1}{7} \langle 6, 2, -3 \rangle$

29.



$v_1 = |v| \cos(\pi/3) = 4 \cdot \frac{1}{2} = 2$

$v_2 = |v| \sin(\pi/3) = 4 \cdot \frac{\sqrt{3}}{2} = 2\sqrt{3}$

$\vec{v} = \langle v_1, v_2 \rangle$

$= \langle 2, 2\sqrt{3} \rangle.$

47. $|\vec{r} - \vec{r}_0|$ is the distance between (x, y, z) and (x_0, y_0, z_0) so the set of points is a sphere with radius 1, and centre (x_0, y_0, z_0)

You can also do this algebraically

$|\vec{r} - \vec{r}_0| = 1 \Leftrightarrow \sqrt{(x-x_0)^2 + (y-y_0)^2 + (z-z_0)^2} = 1$

so $(x-x_0)^2 + (y-y_0)^2 + (z-z_0)^2 = 1.$