Homework 1 solution and rubric
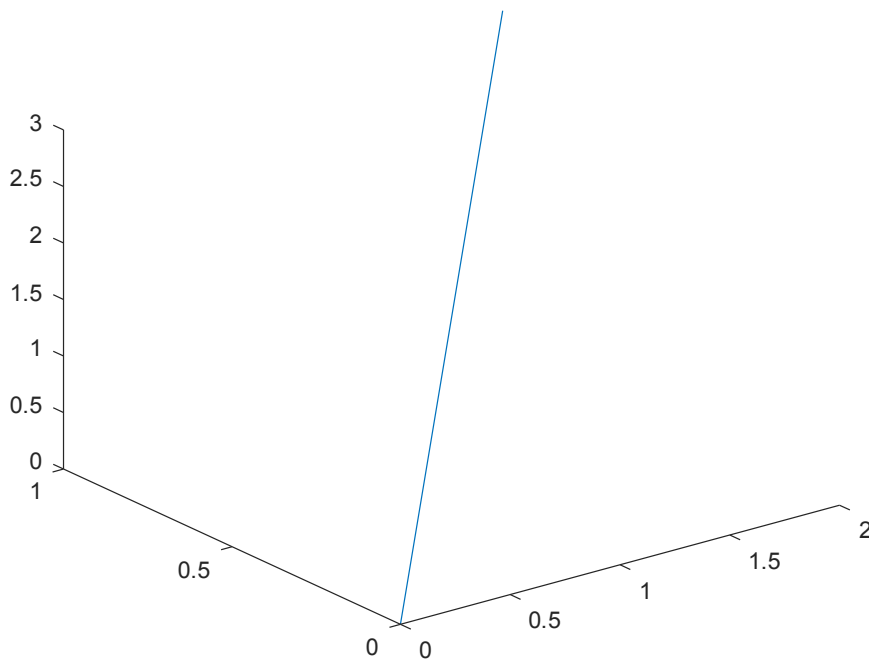
Every question is 5 points equally.

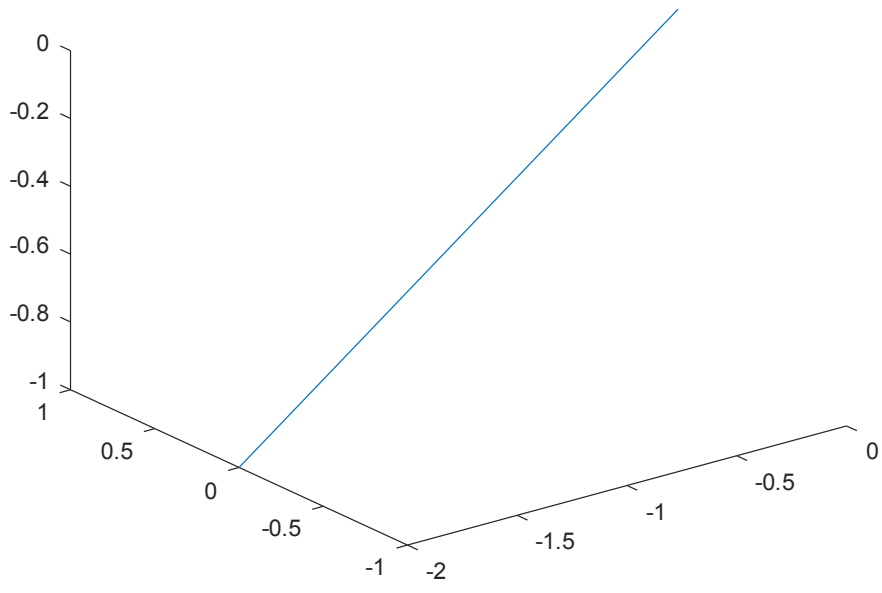8.

-v=(-2,-1,-3);

v+w=(2,1,3)+(-2,0,-1)=(0,1,2)

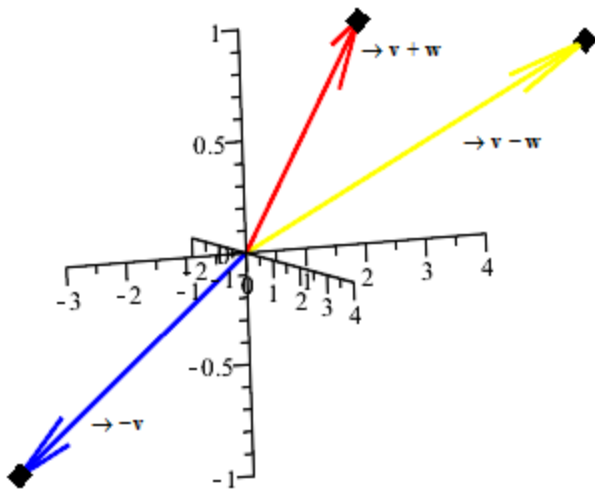v-w=(2,1,3)-(-2,0,-1)=(4,1,4)

The above is V.

The above is W

There are 5 vectors need to be drawn and drawing one vector correctly is 1 point. It does not need to be so accurate, and looks good will be given full credit.

21.

Yes, these points lie on the same line   -----------------------------------1 point.

Find the parametric equations passing any two points ------------------------3 points.

I will use first two points as an example.

x=x1+(x2-x1)t=2+(2-2)t=2,

y=y1+(y2-y1)t=3+(1-3)t=3-2t

z=z1+(z2-z1)t=-4+(-1+4)t=-4+3t

so the parametric equation is (2,3-2t,-4+3t).

Then the rest point fit in that equation---1 point.

When t =-1, (2,7,-10) fits that equation.

Any reasonable way to get the conclusion also gets the full credit, and all of them need explanations.

24.

When this line intersects with xy-plane, z=0.

z=-2+t=0   t=-2

so x=3+2*2=7

y=8*2+7=23

so the line intersects with the xy-plane at (7,23,0)-------------------------------------1.5 point

when this line intersects with xz-plane, y=0.

Y=7+8t=0 t= -7/8

So X=3+2*(-7/8)=5/4

Z=-2-7/8=-23/8

So the line intersects with the xz-plane at (5/4,0,-23/8)--------------------------------1.5 point

When this line intersects with yz-plane, x=0

X=3+2t=0 t=-3/2

So y=7+8*(-3/2)=-5

Z=-2-3/2=-3.5

So the line intersects with yz-plane at (0,-5,-3.5)--------------------------------------1.5 point

The rest 0.5 point is rewarded for showing something in this question.

27.

If the two lines are intersected, then at one point every coordinate in these two lines are the same.

Suppose they are intersected, then 3t+2=3s-1, t-1=s-2, 6t+1=s. Based on calculation when t=0, s=1, it works. --4 points

Therefore, they intersect.---1 point