

# Points, Lines and Planes

Point

$\cdot A$

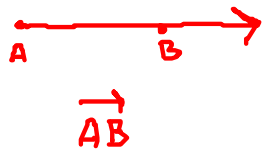
Line



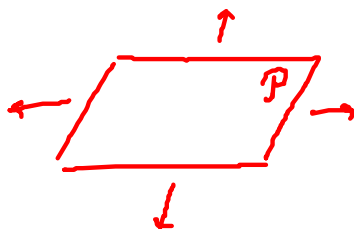
Line Segment



Ray

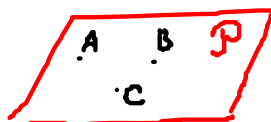


Plane



Coplanar

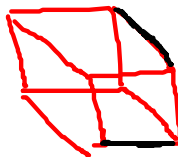
- points that lie in the same plane



Collinear - points lie on the same line



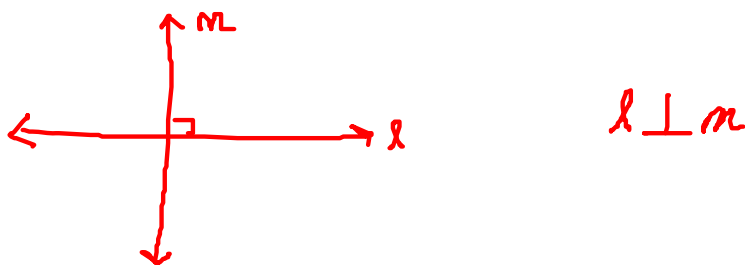
Skew Lines - parallel lines that do not lie on the same plane



Parallel Lines - lines that do not intersect



Perpendicular Lines - lines that intersect at a  $90^\circ$  angle

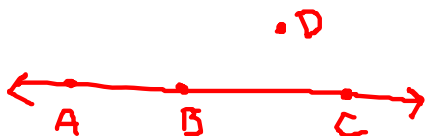


Directions: Draw and label a figure for each relationship.

1. Point A lies on  $\overline{BC}$ .



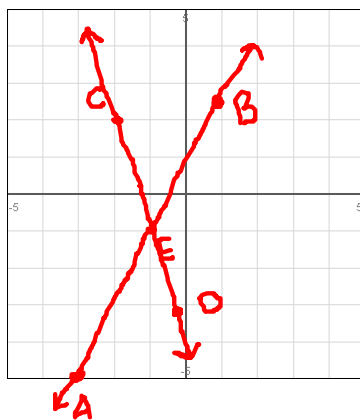
2. Points  $A$ ,  $B$  and  $C$  are collinear. Points  $A$ ,  $B$ ,  $C$  and  $D$  are noncollinear.



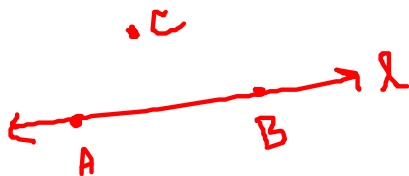
3.  $\overleftrightarrow{AB}$  lies in plane  $\mathcal{R}$  and contains point  $C$ .



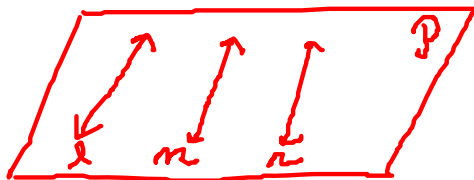
4.  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  intersect at  $E(-1, -1)$  for  $A(-3, -5)$  and  $C(-2, 2)$ .



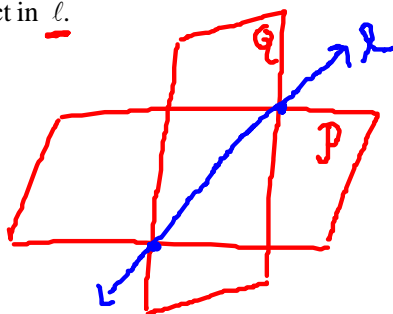
5. Line  $\ell$  contains  $A$  and  $B$ , but does not contain  $C$ .



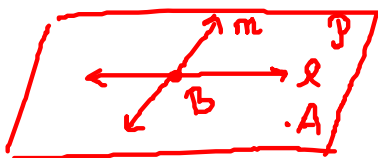
6. Lines  $\ell$ ,  $m$  and  $n$  are coplanar, but do not intersect.



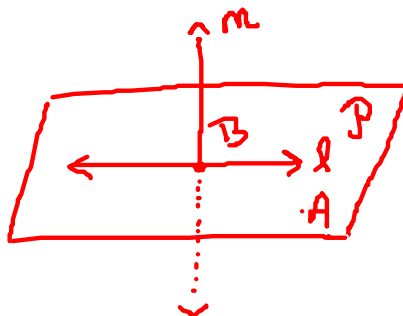
7. Planes  $\mathcal{P}$  and  $\mathcal{Q}$  intersect in  $\ell$ .



8. Point  $A$  and line  $\ell$  lie in  $\mathcal{P}$ . Line  $\ell$  intersects line  $m$  at  $B$ . Line  $\ell$  and  $A$  are coplanar but  $\ell$ ,  $m$  and  $A$  are not.

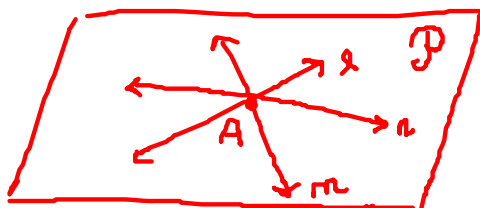


incorrect  
because  $m$   
lies in  $\mathcal{P}$

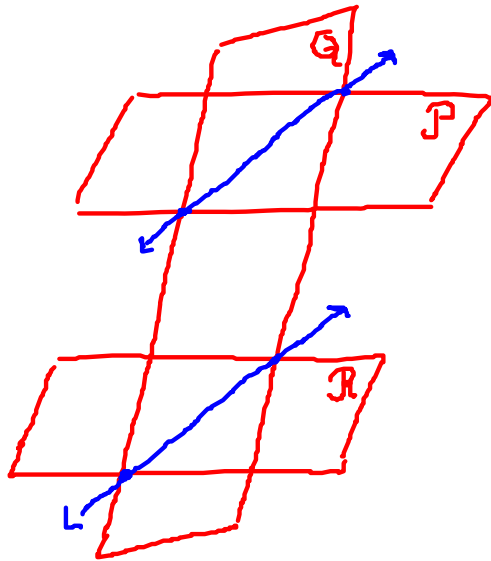


correct because  
 $m$  does not lie  
in  $\mathcal{P}$

9. Lines  $\ell$ ,  $m$  and  $n$  are coplanar, and meet at point  $A$ .



10. Planes  $\mathcal{P}$  and  $\mathcal{Q}$  intersect, and planes  $\mathcal{Q}$  and  $\mathcal{R}$  intersect, but planes  $\mathcal{P}$  and  $\mathcal{R}$  do not intersect.



11. Line  $\ell$  lies in planes  $\mathcal{P}$ ,  $\mathcal{Q}$  and  $\mathcal{R}$ .

