Geometry

Ch. 1 Handout 1.3

Points, Lines, and Planes

Space

BUT

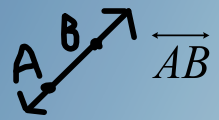
Three basic undefined terms

1 Point Pull

Pull a location, has no size, named by capital letters .A

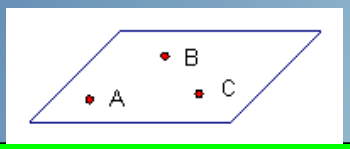
2 Line Pull

Pull a series of points that extend in two opposite directions without end.



3 Plane Pull

Pull a flat surface that has no thickness; contains many lines and extends without end in the direction of all its lines.

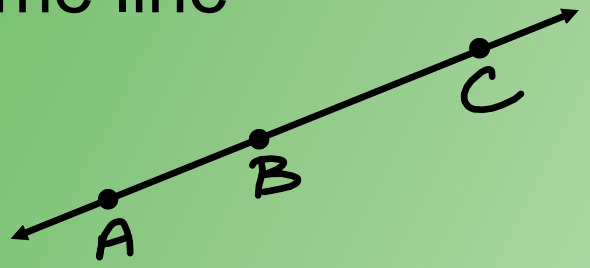


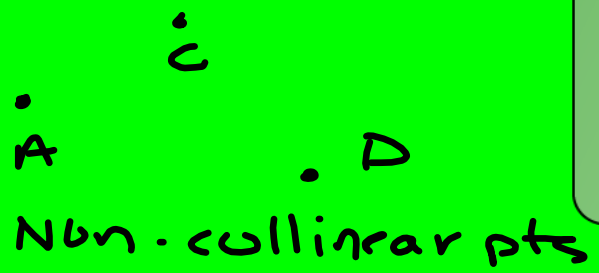
plane ABC

Collinear points

Pull

points that lie on the same line

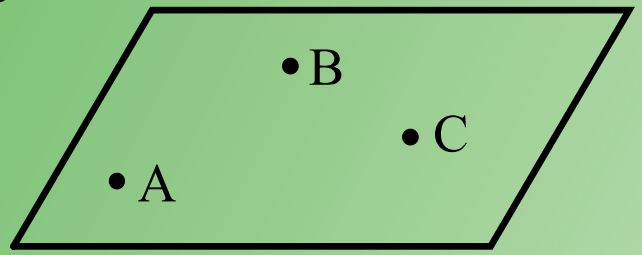




Coplanar points

Pull

points that lie on the same plane



Two points or lines are coplanar if

Pull

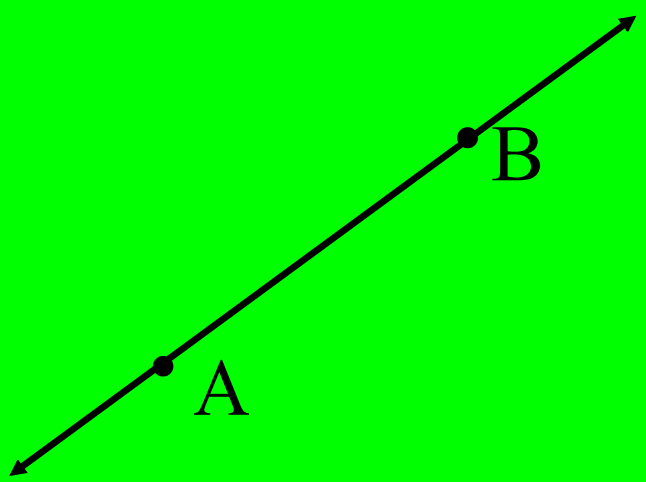
they lie on the same plane

Postulate

Pull

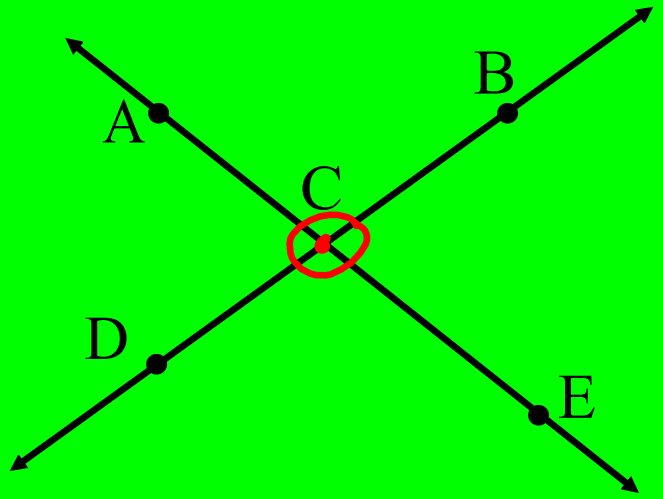
accepted without proof. (accepted statement of fact)

Postulate 1.1 -- Through any two points there is exactly one line.



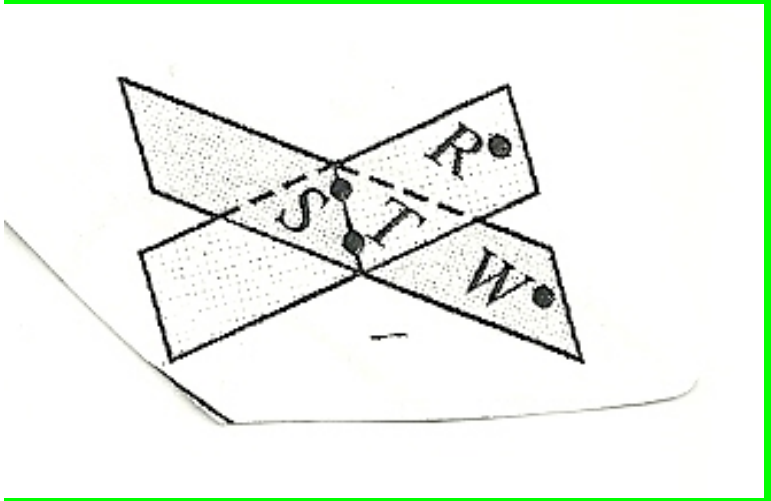
Line t is the only line that passes through point A and B.

Postulate 1.2 -- If two lines intersect, then they intersect in exactly one point.



$\overleftrightarrow{AE}$ and $\overleftrightarrow{BD}$ intersect at C.

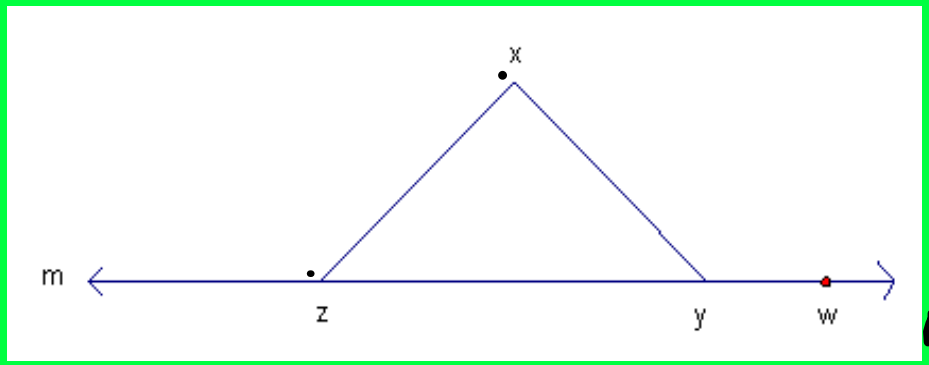
Postulate 1.3 -- If two planes intersect, then they intersect in exactly one line.



Plane RST and plane STW intersect in $\overleftrightarrow{ST}$.

Postulate 1.4 -- Through any three noncollinear points there is exactly one plane.

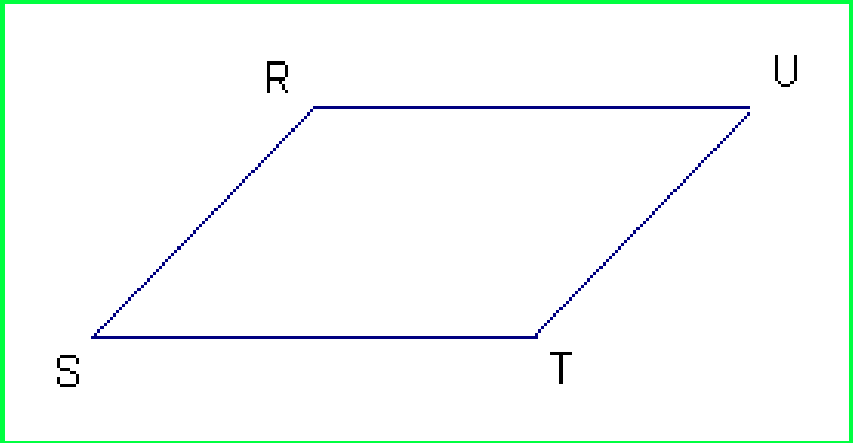
1. In the figure name three points that are collinear and three points that are not collinear.



collinear : Y, Z, W

non-collinear: Z, X, Y

2. You can name a plane using any three or more point on that plane that are not collinear. Name the plane shown in different ways.

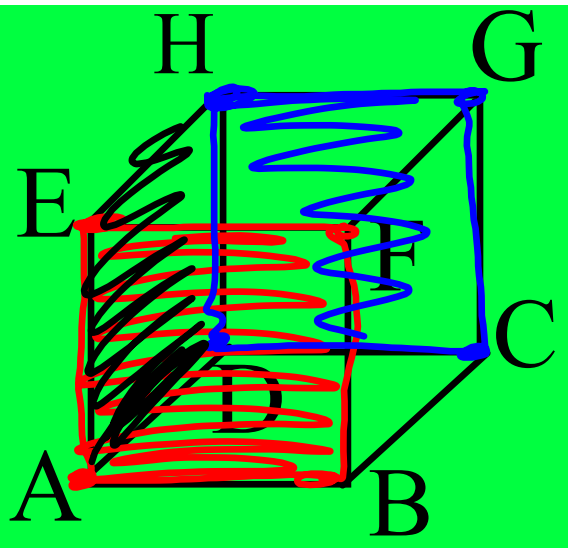


RUTS

SRUT

What is the intersection of plane HGC and plane AED?

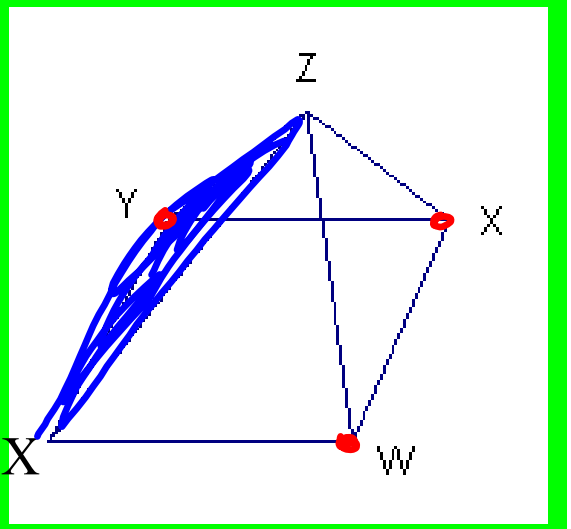
$\overleftrightarrow{HD}$



As you look at the cube, the front face is on plane AEFB, the back face is on plane HGC, and the left face is on plane AED. The back and left faces of the cube intersect at $\overleftrightarrow{HD}$.

Planes HGCD and FGCB intersect vertically at _____.

4. a) Shade the plane that contains X, Y, and Z.

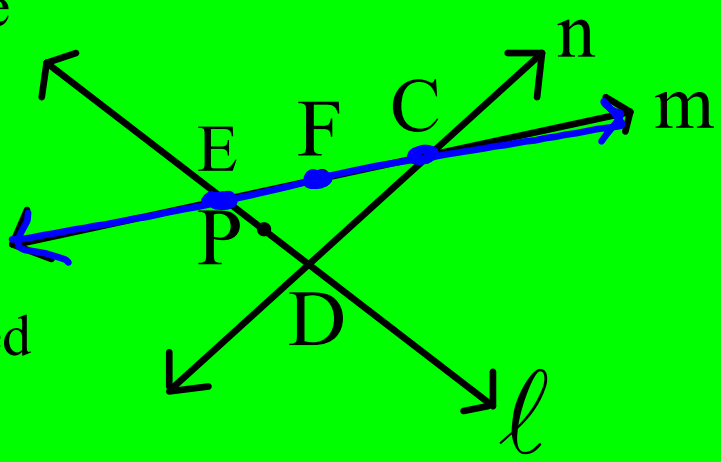


b) Are points W, Y, X collinear?

No

5. a) Using the picture name line m in three different ways.

$\overleftrightarrow{EC}$ $\overleftrightarrow{FC}$



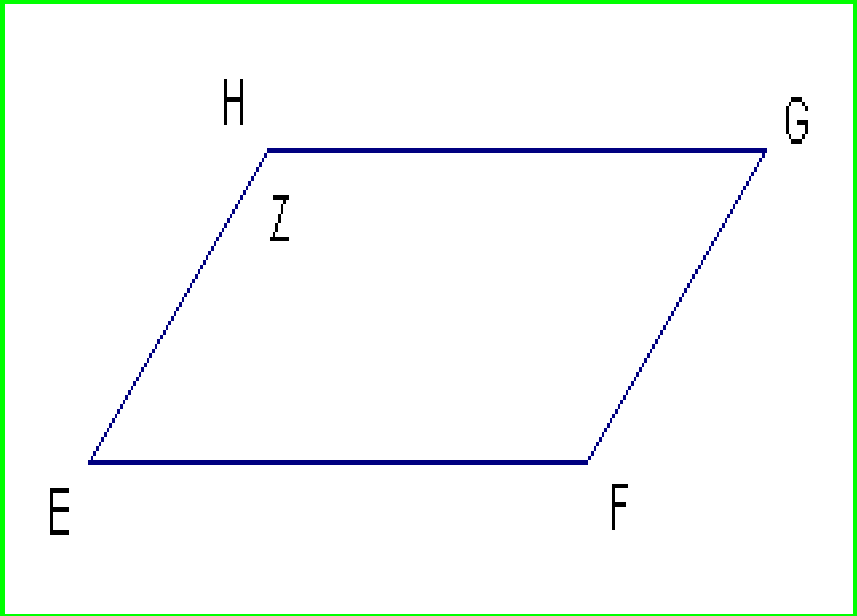
b) Why do you think arrowheads are used when drawing a line or naming a line such as $\overleftrightarrow{PD}$?

shows that it never ends

6. List three different names for plane Z.

HGFE

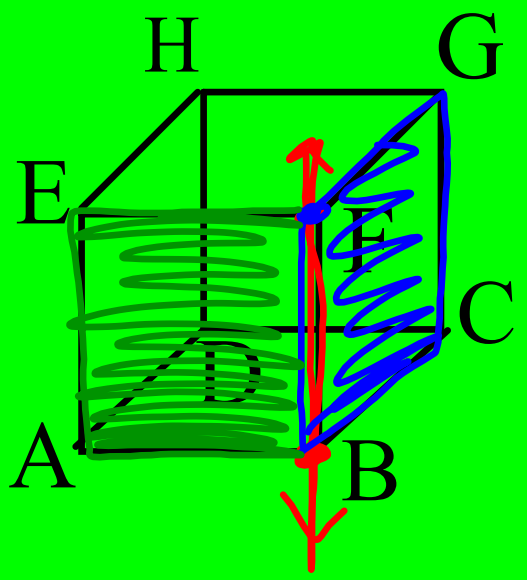
GFEH



7. Name two planes that intersect in $\overleftrightarrow{BF}$?

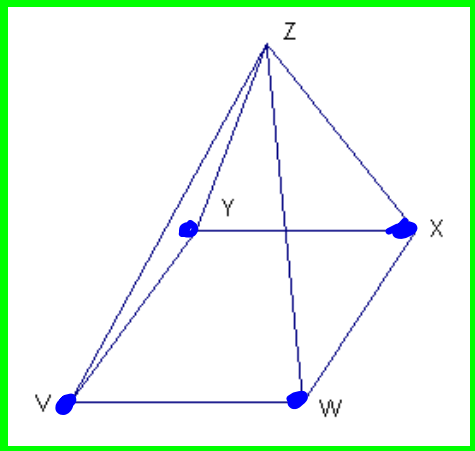
FGCB

FEAB



8. a) Shade plane VWX.
   b) Name a point that is coplanar with points V, W, and X.

Y



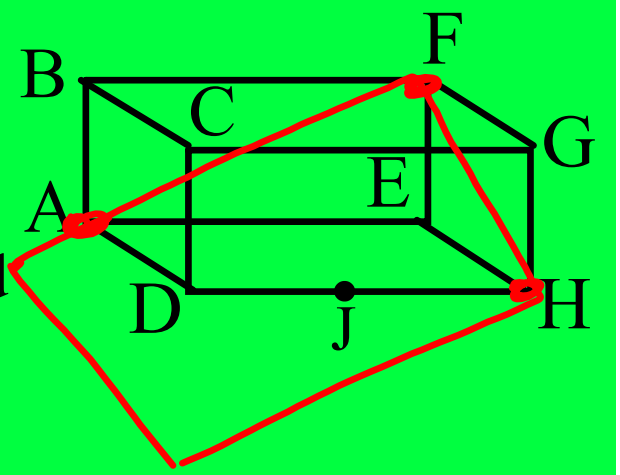
9. a) Name three collinear points.

D, J, H

b) Name two different planes that contain points C and G?

BCGF

CGHD



c) Name the intersection of plane AED and plane HEG.

$\overleftrightarrow{EH}$

d) How many planes contain the points A, F, and H?

ONE

10. Show the conjecture is false by finding one counterexample:

Two planes always intersect in exactly one line.

Assignment

1.3 Pgs 19-21 1-20 all, 22-26 evens, 30-34 evens, 35-43 all, 46-49 all, 55-60 all, 61