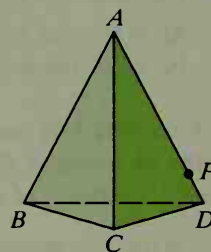
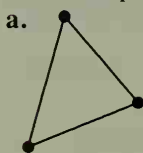


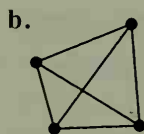
17. Points  $R$ ,  $S$ , and  $T$  are noncollinear points.
- State the postulate that guarantees the existence of a plane  $X$  that contains  $R$ ,  $S$ , and  $T$ .
  - Draw a diagram showing plane  $X$  containing the noncollinear points  $R$ ,  $S$ , and  $T$ .
  - Suppose that  $P$  is any point of  $\overleftrightarrow{RS}$  other than  $R$  and  $S$ . Does point  $P$  lie in plane  $X$ ? Explain.
  - State the postulate that guarantees that  $\overleftrightarrow{TP}$  exists.
  - State the postulate that guarantees that  $\overleftrightarrow{TP}$  is in Plane  $X$ .
18. Points  $A$ ,  $B$ ,  $C$ , and  $D$  are four noncoplanar points.
- State the postulate that guarantees the existence of planes  $ABC$ ,  $ABD$ ,  $ACD$ , and  $BCD$ .
  - Explain how the Ruler Postulate guarantees the existence of a point  $P$  between  $A$  and  $D$ .
  - State the postulate that guarantees the existence of plane  $BCP$ .
  - Explain why there are an infinite number of planes through  $\overline{BC}$ .



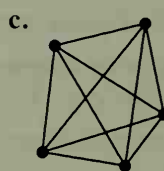
- C** 19. State how many segments can be drawn between the points in each figure. No three points are collinear.



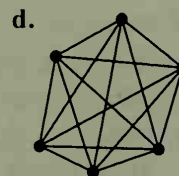
3 points  
? segments



4 points  
? segments



5 points  
? segments



6 points  
? segments

- Without making a drawing, predict how many segments can be drawn between seven points, no three of which are collinear.
  - How many segments can be drawn between  $n$  points, no three of which are collinear?
20. Parts (a) through (d) justify Theorem 1-2: Through a line and a point not in the line there is exactly one plane.
- If  $P$  is a point not in line  $k$ , what postulate permits us to state that there are two points  $R$  and  $S$  in line  $k$ ?
  - Then there is at least one plane  $X$  that contains points  $P$ ,  $R$ , and  $S$ . Why?
  - What postulate guarantees that plane  $X$  contains line  $k$ ? Now we know that there is a plane  $X$  that contains both point  $P$  and line  $k$ .
  - There can't be another plane that contains point  $P$  and line  $k$ , because then *two* planes would contain noncollinear points  $P$ ,  $R$ , and  $S$ . What postulate does this contradict?

