1) If two planes intersect, then their intersection is a point.
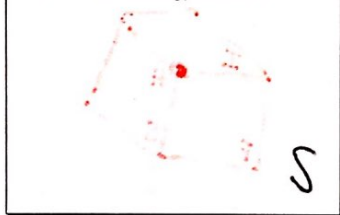
N

2) A point is a subset of space.

A

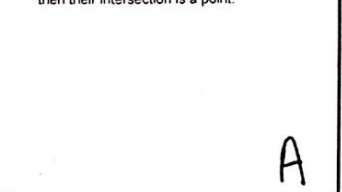3) $\overline{GH}$ is the same as $\overline{HG}$

N

4) Two lines in intersecting planes are skew.

S

5) If a line and a plane intersect, then their intersection is a point.

A

6) Through 3 non-collinear points, there is exactly one line.

N

7) If two distinct planes intersect, then their intersection is a line.

A

8) Two skew lines are coplanar.

N

9) Two lines in the same plane are parallel.

S

10) A ray is shorter than a line.

N

11) A plane contains at least three non-collinear points.

A

12) $\overrightarrow{JK}$ and $\overrightarrow{JL}$ are the same ray.

S

13) Two planes that do not intersect are parallel.

14) Two parallel lines are coplanar.

15) The intersection of a plane and a line is exactly two points.

16) A line contains only two points.

17) Two opposite rays form a line.

Sketches of PLPS Basics

1. How many lines can you draw through one point? **infinite** Draw a single point and use it to demonstrate your answer by drawing a line or lines through that point.

2. How many lines can you draw through two points? **one** Draw two points and use it to demonstrate your answer by drawing a line or lines through the two points.

3. Can you always draw a line through any three points? **no** Draw three points and use them to demonstrate your answer by drawing a line if possible.

4. If you draw two lines, how many times could they intersect? **once** Draw as many examples as are needed to demonstrate your answer.

5. What does it look like when two planes intersect? **line** Draw a picture to demonstrate your answer.

6. Point A:

7. Line:

8. Plane M: Plane M with 3 non-collinear points: Plane M with 3 collinear points:

9. *Length* of Segment: AB

10. Segment: AB

11. Ray:

12. Opposite Rays:

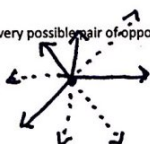13. Space (4 non-coplanar points):

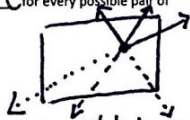## Sketches of PLPS Basics

Intersections

14. 2 Lines:

15. Line and Plane:

16. 2 Planes:

17. 3 Collinear Points: B, A, and T

18. Line M and Line N intersecting at Point X.

19. Lines AB and BC intersecting each other.

20. Lines T, M, and J intersecting at point P.

21. Plane N contains line p.

22. The non-collinear points A, B, and C are all contained in plane N.

23. Points A, B, C, and D are non-coplanar.
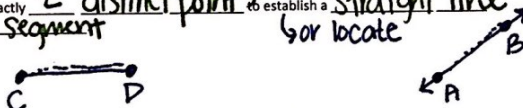
↳ at least 3 points

Euclid's 12 Postulates- Class Notes

1. In space, through a given **point**, there exists a **line** for every possible pair of opposite directions in space.
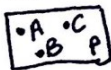   Picture:

2. Through a given **point** in a **plane** there exists one **line** for every possible pair of opposite directions within the plane.
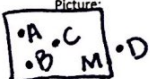   Picture:

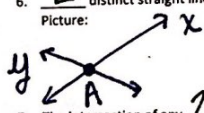3. It requires exactly **2 distinct points** to establish a **straight line** or **line segment** (or locate)
   Picture:

4. It requires exactly **3** distinct **non-collinear** points to establish a **plane**
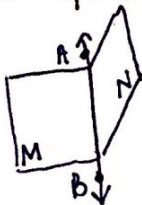   Picture:

5. It requires exactly **4** distinct **non-coplanar** points to establish a region of **space**
   Picture:

6. **2** distinct straight lines can intersect in exactly **1 point**
   Picture:

7. The intersection of any **2** distinct **planes** is a **straight line**
   Picture:

8. An **infinite** number of planes **may** be passed through one **straight line**
   Picture:

9. If a straight line does not intersect a plane at all, then the line is **parallel** to that plane.
   Picture:

10. If a straight line intersects a **plane** in exactly **1 point**, then the line does not **lie** in the plane.
    Picture:

11. If a straight line intersects a plane in more than **1 point**, then the line lies **directly** in the plane. (entirely)
    Picture:

12. Between any **2 points** there exists an **infinite** number of **points**
    Picture: