Zero The Math Hero
Standard Mathematical Elements - Lesson 1

Lesson 1 provides a discussion of the properties of basic shapes of 0, 1, and 2 dimensions, such as:

- points - identify points; name points
- lines - identify lines; name lines; use the correct symbol for lines
- planes - identify planes; name planes

Lesson 1 includes an explanation of the relationship between points, lines, and planes. Four basic postulates are taught and applied.

Zero the Math Hero – Lesson 1

Lesson 1 – "Undefined" Terms

point - a specific location

line - a set of points all on the same straight path, going forever in opposite directions

Symbol for line: $\overleftrightarrow{AB}$

plane - a set of points all on the same flat surface, going forever in *all* directions

Lesson 1 – Definitions

space - the set of all possible points

collinear - when points are on the same line

noncollinear - when points are *not* on the same line

coplanar - when points (or lines) are on the same plane

noncoplanar - when points (or lines) are *not* on the same plane

Lesson 1 – Postulates

Postulate 1 - Through any two points there is exactly one line.

Postulate 2 - If two lines intersect, then they will intersect in exactly one point.

Postulate 3 - If two planes intersect, then they will intersect in exactly one line.

Postulate 4 - Through any three noncollinear points there is exactly one plane.

Name:_____

Date:_____

Lesson 1 - Practice Problems

Points, Lines, and Planes

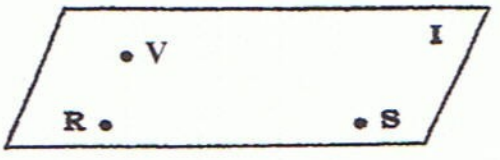
1. Name this point.

1. _____

2. Name line b in another way.

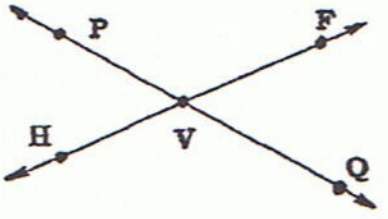
2. _____

3. Name plane I in another way.



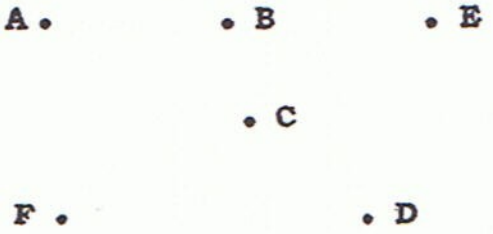
3. _____

4. What is the intersection of $\overleftrightarrow{PQ}$ and $\overleftrightarrow{FH}$?



4. _____

5.- 8. Write **YES** or **NO** to indicate if these points are collinear or not.



5. B, C

5. _____

6. F, B

6. _____

7. B, C, D

7. _____

8. A, B, E

8. _____

Name:_____

Date:_____

Lesson 1 - Practice Problems - Continued

Points, Lines, and Planes

9. - 13. Write **YES** or **NO** to indicate if these points are coplanar or not.

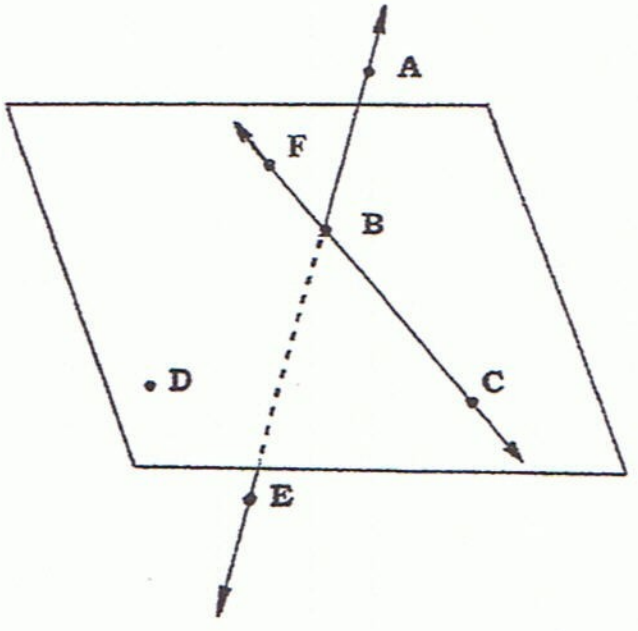
9. F, B, C

10. A, B, E

11. D, B, C, E

12. F, B, D, E

13. A, B, D, E



9. _____

10. _____

11. _____

12. _____

13. _____

Name: _____

Date: _____

Quiz - Terms and Postulates

Zero the Math Hero – Lesson 1

Lesson 1 – Terms

Directions: Fill in each blank with the letter that corresponds to the correct answer, A-H.

1. _____ when points are on the same line
2. _____ a set of points all on the same straight path, going forever in opposite directions
3. _____ when points (or lines) are on the same plane
4. _____ the set of all possible points
5. _____ when points are *not* on the same line
6. _____ a set of points all on the same flat surface, going forever in *all* directions
7. _____ when points (or lines) are *not* on the same plane
8. _____ a specific location

A. point
B. line
C. plane
D. collinear
E. noncollinear
F. coplanar
G. noncoplanar
H. space

Lesson 1 – Postulates

Directions: Each postulate is missing one word, indicated by "(?)". Use the letter choices beneath each postulate to indicate the correct missing word.

9. _____ Through any two points there is exactly one (?).
   I. plane J. space K. line L. point

10. _____ If two (?) intersect, then they will intersect in exactly one point.
    M. lines N. spaces O. points P. planes

11. _____ Through any three (?) points there is exactly one plane.
    Q. straight R. noncollinear S. noncoplanar T. linear

12. _____ If two (?) intersect, then they will intersect in exactly one line.
    U. lines V. points W. planes X. spaces

Name: ANSWER KEY

Date: _____

Lesson 1 - Practice Problems

Points, Lines, and Planes

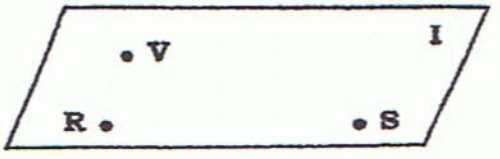
1. Name this point.

1. Q (or point Q)

2. Name line b in another way.

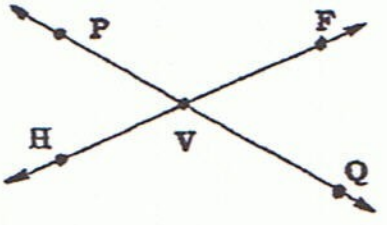
2. $\overleftrightarrow{XT}$ (or $\overleftrightarrow{TX}$, line TX, line XT, b)

3. Name plane I in another way.



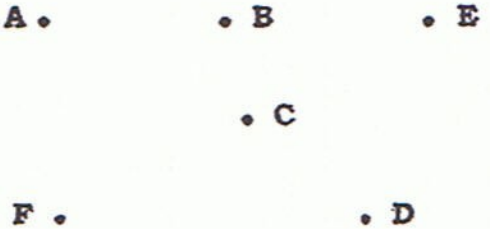
3. plane RVS (Letters can be in any order.)

4. What is the intersection of $\overleftrightarrow{PQ}$ and $\overleftrightarrow{FH}$?



4. V (or point V)

5.- 8. Write **YES** or **NO** to indicate if these points are collinear or not.



5. B, C — 5. YES

6. F, B — 6. YES

7. B, C, D — 7. No

8. A, B, E — 8. YES

Name: ANSWER KEY

Date: _____

Lesson 1 - Practice Problems - Continued

Points, Lines, and Planes

9. - 13. Write **YES** or **NO** to indicate if these points are coplanar or not.

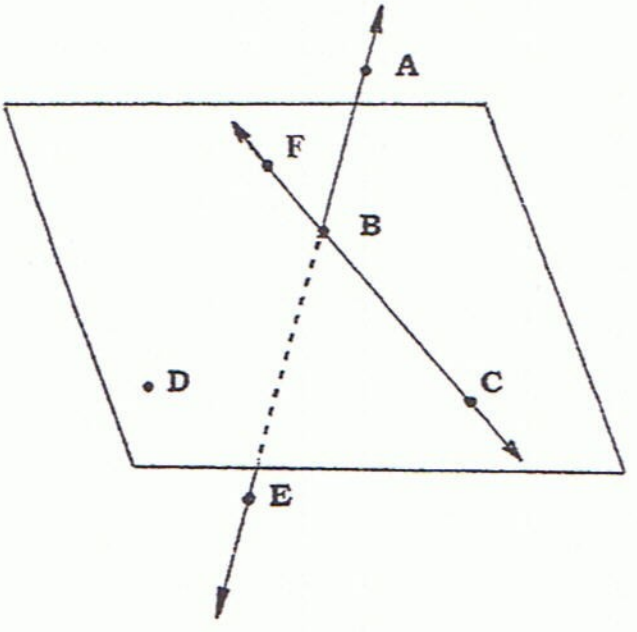
9. F, B, C

10. A, B, E

11. D, B, C, E

12. F, B, D, E

13. A, B, D, E



9. YES

10. YES

11. NO

12. NO

13. YES

Name: ANSWER KEY

Date: _____

Quiz - Terms and Postulates

Zero the Math Hero – Lesson 1

Lesson 1 – Terms

Directions: Fill in each blank with the letter that corresponds to the correct answer, A-H.

1. D when points are on the same line
2. B a set of points all on the same straight path, going forever in opposite directions
3. F when points (or lines) are on the same plane
4. H the set of all possible points
5. E when points are *not* on the same line
6. C a set of points all on the same flat surface, going forever in *all* directions
7. G when points (or lines) are *not* on the same plane
8. A a specific location

A. point
B. line
C. plane
D. collinear
E. noncollinear
F. coplanar
G. noncoplanar
H. space

Lesson 1 – Postulates

Directions: Each postulate is missing one word, indicated by "(?)". Use the letter choices beneath each postulate to indicate the correct missing word.

9. K Through any two points there is exactly one (?).
   I. plane **J.** space **K.** line **L.** point
10. M If two (?) intersect, then they will intersect in exactly one point.
   M. lines **N.** spaces **O.** points **P.** planes
11. R Through any three (?) points there is exactly one plane.
   Q. straight **R.** noncollinear **S.** noncoplanar **T.** linear
12. W If two (?) intersect, then they will intersect in exactly one line.
   U. lines **V.** points **W.** planes **X.** spaces