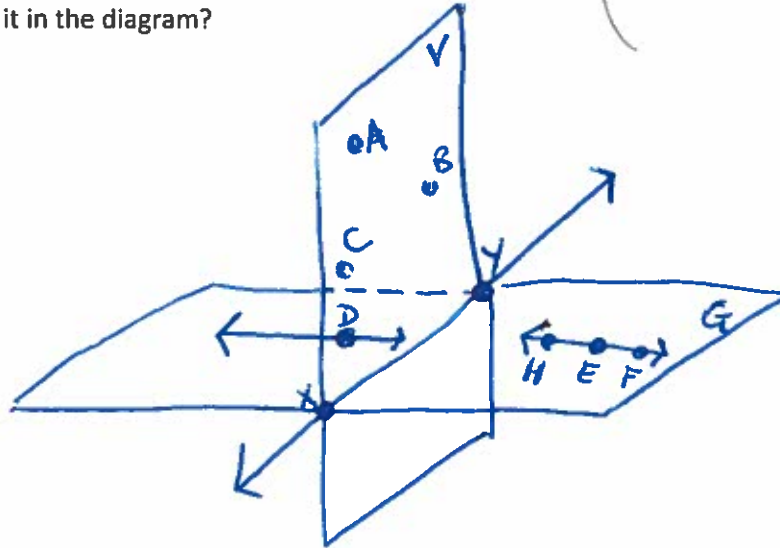
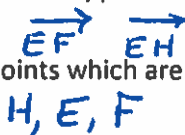


1. Sketch two intersecting planes. Label the planes V and G. Name the intersection of plane V and plane G. What did you name it in the diagram?



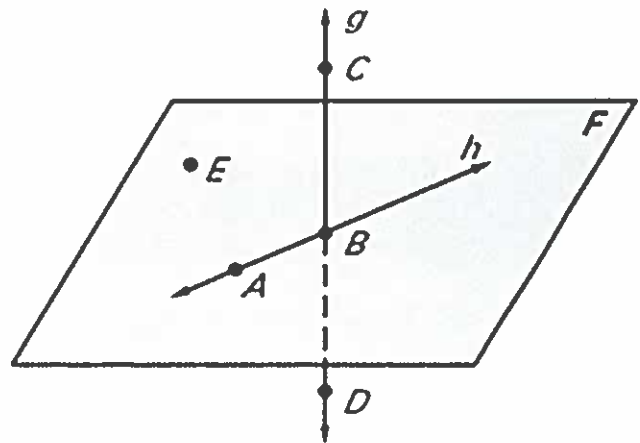
2. Add 3 coplanar points to the diagram above. Label them A, B, and C.
3. Sketch a line in one of the planes which intersects the other plane at point D.
4. Sketch a pair of opposite rays in plane G. Labeling points as necessary, what are the names of the rays?
5. Sketch 3 points which are collinear. Label them in the diagram and name them here.
6. Draw 3 points which are NOT collinear. Label them in the diagram and name them here.



A, B, C

Use the diagram at the right to answer the questions below.

7. Give two other names for  $\overleftrightarrow{AB}$ .
8. Name three points that are collinear.
9. Give another name for plane F.
10. Name a point that is not coplanar with A, B, and C.
11. Give another name for  $\overleftrightarrow{CD}$ .
12. Name three rays with endpoint B.
13. Name a pair of opposite rays.
14. Give another name for  $\overleftrightarrow{CD}$ .



$\overleftrightarrow{BA}$  line h

C, B, D

A, B, E

C

$\overleftrightarrow{DC}$

$\overrightarrow{BC}$   $\overrightarrow{BA}$   $\overrightarrow{BD}$

$\overrightarrow{BC}$   $\overrightarrow{BD}$

$\overrightarrow{CB}$

**For Venn Diagrams, know:**

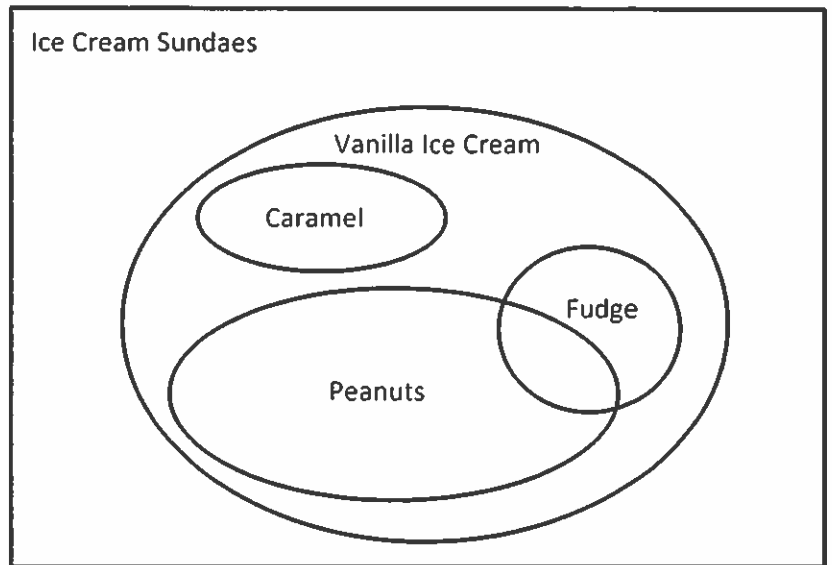
- How to draw a Venn Diagram from a description.
- How to describe a Venn Diagram using the words all, some, or no.

Fill in the blank with **all**, **some** or **no**, using the diagram at the right.

15. All sundaes had vanilla ice cream.

16. No sundaes with fudge had caramel.

17. Some sundaes with peanuts had fudge.



**For conditional statements, know:**

- How to write a conditional statement in if-then form.
- How to negate a statement.
- How to identify the hypothesis and the conclusion of a conditional statement.
- How to create the inverse, converse, and contrapositive of a conditional statement.
- How to identify and write a bi-conditional statement.
- How to use logical symbols ( if  $p$  , then  $q$  ,  $\sim$  )

**For deductive reasoning, know:**

- How to use and apply the Law of Detachment.
- How to use and apply the Law of Syllogism.

**Write each statement in if-then form.**

18. All students at Hermitage take an English class.

If you are a student at Hermitage, then you take an English class.

19. All right angles measure  $90^\circ$ .

If it is a right angle, then it measures  $90^\circ$ .

20. Every dog has four legs.

If it is a dog, then it has four legs.

Write the converse, inverse, and contrapositive of the given conditional statement.

If it is Saturday, then school is closed.

Switch 21. Converse: If school is closed, then it is Saturday.

Negate 22. Inverse: If it is NOT Saturday, then school is NOT closed.

Switch-negate 23. Contrapositive: IF school is NOT closed, then it is NOT Saturday.

Show that each conditional is false by finding a counterexample.

24. If it is 12:00 noon, then the sun is shining. Sun shines at 1:00 pm

25. If a number is divisible by 3, then it is odd. 12 is divisible by 3 but is even.

Choose 2 statements from the 3 below, one of which has a true converse and one of which has a false converse. Write a biconditional for the statement with a true converse. Write a counterexample for the statement with a false converse.

26. If the sun is shining, then it is 12:00 noon. False Sun shines at 1:00 pm  
converse: If it is 12:00 noon, then the sun is shining.

27. If the number is divisible by 3, then the number is odd. False 12 is divisible by 3 and even.  
converse: If the number is odd, then it is divisible by 3.

28. If an angle is  $90^\circ$ , then it is a right angle. It is a right angle if and only if  
converse: If it is a right angle, then it is  $90^\circ$ . It is ~~not~~  $90^\circ$ .

Write each definition as a biconditional.

29. As isosceles triangle has at least two congruent sides. It is an isosceles triangle if and only if at least two sides are congruent

30. A cube is a three-dimensional solid with six square faces. A cube is three-dimensional solid if and only if it has six square faces.

Write each sentence in symbolic form, using the given symbols.

$p$ : The test is easy

$q$ : Sam studies

$r$ : Sam passes the test

31. If the test is easy, then Sam will pass the test.  $p \rightarrow r$

32. Sam will pass the test if and only if he studies.  $r \leftrightarrow q$

33. If the test is not easy, then Sam will pass the test.  $\neg p \rightarrow r$

34. The test is easy if Sam studies.  $q \rightarrow p$

If Sam studies, then the test is easy

35. Sam will not pass the test if Sam doesn't study.  $\neg q \rightarrow \neg r$

If Sam doesn't study, then he won't pass the test

36. Sam passes the test if the test is easy.  $p \rightarrow r$

If the test is easy, then Sam passes the test.

rewrite "if" in "form"

In the problems below, symbols are assigned to represent statements.

Let  $j$  represent "I jog."

Let  $d$  represent "I diet."

Let  $g$  represent "I feel well."

Let  $h$  represent "I get hungry."

For each statement in symbolic form, write out the conditional statement.

37.  $j \rightarrow g$ : If I jog, then I feel well

38.  $\sim g \rightarrow j$ : If I do NOT feel well, then I jog.

39.  $\sim d \rightarrow \sim h$ : If I do NOT diet, then I do NOT get hungry.

Write a valid conclusion for the following sets of statements. Then give a reason (Law of Syllogism or Detachment). If no valid conclusion exists, write "None."

40. If I eat pretzels, then I get thirsty. I eat pretzels.

Therefore, I get thirsty (LOD)

41. If I run, then I get tired. If I go to school, then I walk.

Therefore, None

42. If the moon is full, then the wolves come out. The wolves came out.

Therefore, None

43. If I learn math, then I will feel successful. If I feel successful, then I throw a party.

Therefore, If I learn math, then I throw a party.