



CHAPTER 8: STATISTICS AND ANGLE RELATIONSHIPS

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A large grid area for writing notes, consisting of approximately 20 columns and 30 rows of small squares.		

Notes:

TYPES OF SAMPLES FROM A POPULATION



When taking a survey, the **population** is the group of people about whom the information is to be gathered. For example, if you wanted to conduct a survey about what foods to serve in the cafeteria, the population would be the entire student body. Since it is not usually convenient to survey the total population, different kinds of **samples** may be used.

A **representative sample** is a subgroup of the population that matches the general characteristics of the entire population. If you choose to sample 10% of the students, you would need to include an equivalent fraction of students from each grade and an equivalent ratio of male to female students as the larger population.

A **convenience sample** is a subgroup of the population where it is easy to collect data. Only sampling the students in your homeroom, for example, would be convenient, but would not necessarily accurately represent the entire school.

A **cluster sample** is a subgroup of the population that contains a common characteristic. Sampling only the eighth graders, in the above example, would be a cluster sample. Again, this sample would not necessarily represent the entire school.

A **voluntary response sample** contains only the sample of the population that chose to respond. This also would not necessarily represent the entire population.

RANDOM SAMPLES



There are many techniques for taking samples from populations. You are familiar with convenience samples, voluntary response samples, and cluster samples. However, a **random sample** is the best way to get a sample that is most representative of the population.

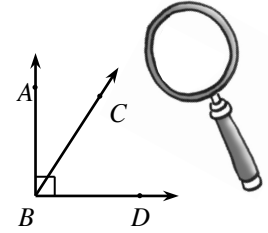
If you were conducting a survey, you might think it would be a good idea to pick some athletes, some band members, and some honor students to represent the school. The problem with intentionally sampling students is that it is too easy to miss an important group of students. By *randomly* picking students you would get some athletes, some band members, and some honor students. But most importantly, you would also get some students that you forgot about or did not know about, such as, the drama club students.

A random sample is representative of the whole population. Therefore, you can use random samples to make **inferences** (predictions) about characteristics of the whole population, without having to measure every single item in the population.

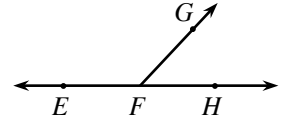
Notes:

ANGLE RELATIONSHIPS

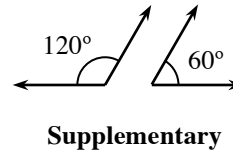
It is common to identify angles using three letters. For example, $\angle ABC$ means the angle you would find by going from point A , to point B , to point C in the diagram at right. Point B is the **vertex** of the angle (where the endpoints of the two sides meet) and BA and BC are the rays that define it. A **ray** is a part of a line that has an endpoint (starting point) and extends infinitely in one direction.



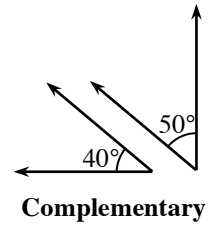
If two angles have measures that add up to 90° , they are called **complementary angles**. For example, in the diagram above right, $\angle ABC$ and $\angle CBD$ are complementary because together they form a right angle.



If two angles have measures that add up to 180° , they are called **supplementary angles**. For example, in the diagram at right, $\angle EFG$ and $\angle GFH$ are supplementary because together they form a straight angle.



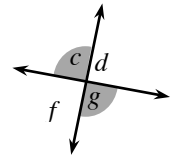
Supplementary



Complementary

Two angles do not have to share a vertex to be complementary or supplementary. The first pair of angles at right are supplementary; the second pair of angles are complementary.

Adjacent angles are angles that have a common vertex, share a common side, and have no interior points in common. So $\angle c$ and $\angle d$ in the diagram at right are adjacent angles, as are $\angle c$ and $\angle f$, $\angle f$ and $\angle g$, and $\angle g$ and $\angle d$.



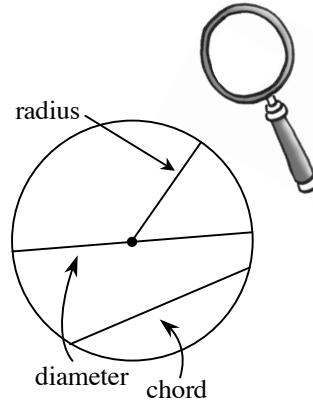
Vertical angles are the two opposite (that is, non-adjacent) angles formed by two intersecting lines, such as angles $\angle c$ and $\angle g$ in the diagram above right. $\angle c$ by itself is not a vertical angle, nor is $\angle g$, although $\angle c$ and $\angle g$ together are a pair of vertical angles. Vertical angles always have equal measure.

CIRCLE VOCABULARY

The **radius** of a circle is a line segment from its center to any point on the circle. The term is also used for the length of these segments. More than one radius are called **radii**.

A **chord** of a circle is a line segment joining any two points on a circle.

A **diameter** of a circle is a chord that goes through its center. The term is also used for the length of these chords. The length of a diameter is twice the length of a radius.



Notes:

TRIANGLE INEQUALITY

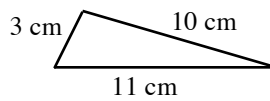
For any three lengths to form a triangle, the sum of the lengths of any two sides must be greater than the length of the third side.

For example, the lengths 3 cm, 10 cm, and 11 cm will form a triangle because

$$3 + 10 > 11$$

$$3 + 11 > 10$$

$$10 + 11 > 3$$



The lengths 5 m, 7 m, and 15 m will not form a triangle because $5 + 7 = 12$, and $12 \not> 15$.

