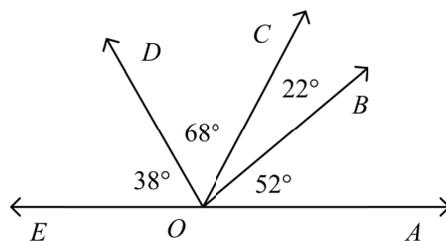


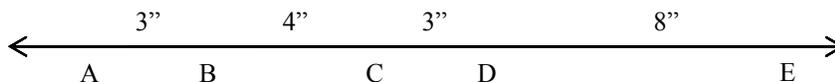
Use the figure to the right to answer the following questions.

37. What is $m\angle AOC$?
38. What is $m\angle BOD$?
39. What is $m\angle EOC$?
40. What kind of angles are $\angle BOC$ and $\angle COD$?
41. Give an example of two supplementary angles from the drawing.



Use the figure below to answer the following questions.

42. What is AC ?
43. What is AD ?
44. What is AE ?
45. Give two segments from the figure that are congruent.



Section 1.8 – Application: Ballistics

If you take two baseballs and throw one straight ahead and the other at a 45° angle which one will go farther? Which one will get to the ground first? How about if you're firing a rocket instead of a baseball? That's a much more complicated situation because the rocket gets lighter as its fuel gets used up. These are the sorts of questions that are answered by ballistics – the study of how “projectiles”, such as bullets, rockets and baseballs, behave.



What Are We Doing? We're going to use a Nerf or dart gun to fire "projectiles" at measured angles. We'll attach a wire to the gun so that we can accurately measure the firing angle and then use a tape measure to get the distance.

- Equipment**
- Nerf gun
 - Thin dowel or wire
 - Protractor
 - Tape measure

- Procedure**
1. Secure the wire to the side of the gun so that it points in the direction the Nerf ball will go. When you put the butt of the gun on the ground and point it into the air the wire should just touch the ground. You may need to adjust this as you make different shots so don't secure it too tightly.
 2. Load the weapon and position it on the ground. Use a protractor to measure the firing angle.
 3. Fire the gun and measure the distance from the spot where you fired to the place where the projectile lands.
 4. Repeat the process with different angles. You may need to turn the gun on its side for smaller angles. Fill in your results on the chart on the following page in the Distance 1 column.
 5. Attach a penny to the end of the projectile.

6. Repeat steps 3 through 6. Put your results in the Distance 2 column.
7. Add another penny and repeat the process again using the Distance 3 column.

Warnings

- Try to find an enclosed area to do your firing. A garage works well or a backyard with a solid fence. Wind can affect your results so if you have to do it outside be sure it's a calm day.
- Always use the middle: When you're putting the wire on the gun line it up with the middle of the barrel. When you're measuring the distance traveled use the middle of the landing spot.

Questions

1. Based on your experiment what angle gives the maximum distance?
2. Based on your experiment what affect does weight have on the distance the ball travels? What effect does it have on the angle that gives the maximum distance?

