Spartan Firearms Training Group, LLC

Tip of the Week: November 17, 2025

Understanding Minutes of Angle (MOA)

[*Note: Please remember that the information below only applies to red dot optics on handguns. We are unsure whether it applies to those optics on rifles. Additionally, the information is tailored for red dot optics with adjustable dials utilizing a 1 MOA/click adjustment. If your adjustment dials use a different MOA, you will need to interpret the information to make your adjustments, which brings us to an important point—know your handgun and the optic you mount on it*.]

HISTORICAL OVERVIEW

Shooters who want to zero their handguns or rifles with "red dot" optics use "minutes of angle" (MOA) to make those adjustments. Understanding how to work with MOAs can be confusing for some people. In this article, we define MOA and describe how to use it to zero the "red dot" on your handgun.

> "The MOA system has its roots in ancient history, originating with the Sumerians around the 3rd millennium BC. They were the first to divide a circle into 360 degrees. The Babylonians later refined this concept by subdividing each degree into 60 arcminutes." (https://snipercountry.com/mrad-vs-moa/, September 19, 2024).
>
> A minute of angle (arcminute) is used to measure angles in much the same way as degrees. When astronomers and navigators needed to measure tiny angles in the sky, they divided each degree on their measuring instrument into 60 smaller parts. Those smaller parts were called minutes of arc (or just minutes). Therefore, an MOA is a 1/60th slice of the circle.

We're not sure when people started using angular measurements for aiming firearms, but when they did, they borrowed the same minute of angle system.

HERE'S HOW TO PICTURE IT

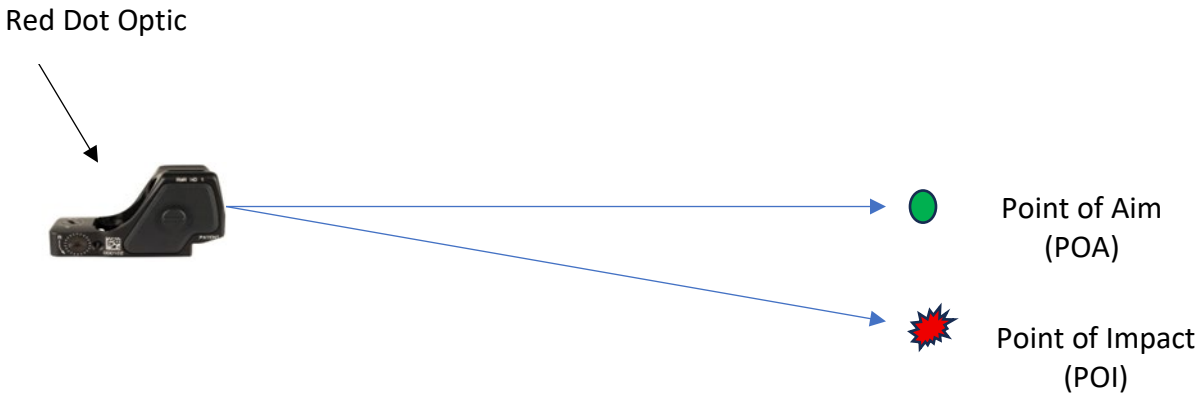
You are at the range. Your target is set at the 25-yard mark. Look straight at the target through your optic with the dot overlaying the center of the target. That's your line of sight.

Now, imagine a second line starting at your red dot and moving toward the target, but this line is just 1/60th of a degree apart from the first line. The first line represents your line of sight through the optic. The second line represents the direction from your optic to where the bullet is actually striking the target.

Those two lines start at the same point (your red dot) and can get farther apart the farther they go, thereby creating an angle that resembles a V turned on its side (<) (See Figure 1). The tiny angle between the lines is one minute of angle (1 MOA).

When your red dot optic is zeroed, and assuming you are applying correct firearms handling and marksmanship principles, the two lines should be very close together when your round lands on the target.

Figure 1: Point of Aim vs. Point of Impact



So, let's say you want to zero your handgun's new "red dot" optic at 25 yards, which is frequently recommended.

HERE'S WHAT TO DO

1. Put a bright bullseye sticker on a paper target.
2. Run the target out to 25 yards.
3. Position your handgun on a stable platform. We use a small sandbag.
4. Grip the gun correctly. Overlay the red dot on the center of the bullseye sticker.
5. Maintain a good grip and use a smooth and correct trigger press to shoot 3-5 rounds.
6. Run the target back to your shooting platform and pinpoint the center of the 3-5 round group. Measure the vertical and horizontal distance of the hits from the center of that group to the center of the bullseye (for example, the POI is 3 inches lower than the POA and 5 inches to the right).
7. If your red dot is like mine, it has 1 MOA for each tic mark on the adjustment dials, which means that at 100 yards, each adjustment click moves the point of impact (POI—where the bullet actually lands) by approximately 1 inch (1.047, to be precise).

   1 MOA at 50 yards would move ½ inch per click. So, at 25 yards (¼ of 100), each click would move the POI ¼ of an inch (0.2618 to be precise). So, using the above example of 3 inches low and 5 inches to the right, and remembering that 1 MOA moves the dot ¼ of an inch, you would need to adjust the red dot 12 clicks (3 ÷ ¼) up and 20 clicks (5 ÷ ¼) left to overlay the POI with the POA.

If you want to zero the red dot at a different distance, follow the same procedure (See Table 1).

Table 1: 1 MOA to Inches

Distance	**Exact (1 MOA = 1.047 @100 yds**	**Rounded (1 MOA = 1.00" @100 yds**
10 yards	0.1047 inch	0.10 inch
15 yards	0.1570 inch	0.15 inch
25 yards	0.2618 inch	0.25 inch
100 yards	1.047 inch	1.00 inch

FAIR WARNING

It can become a bit more confusing when you learn that the red dot inside the viewfinder has, for example, a 3.25 MOA, while the adjustment dial for windage and elevation uses 1 MOA per tic mark. Here's an explanation.

A 3.25 MOA dot size covers about 3.25 inches on the target at 100 yards. This doesn't mean that the red dot physically looks 3.25 inches wide to your eye. What it means is that if you were able to walk up to the target and mark the area covered on the target by the dot, that area would measure about 3.25 inches across (5 MOA covers 5 inches, 6 MOA covers 6 inches, and so on).

The dot looks the same size to your eye, no matter how far away the target is. What changes is how much of the target's "real estate" the dot hides.

ABOUT THE SPARTAN FIREARMS TRAINING GROUP

The Spartan Firearms Training Group, LLC (www.spartanftg.com) is a Special Forces Veteran-Owned business formed in 2015 by Paul and Francis Duffy. At the end of March 2025, we entered into our 11th year of business, and we have trained thousands of Maryland residents in a variety of ways, including:

- Concealed carry training
- Handgun Qualification License (HQL) training
- Emergency Casualty Care training
- Long-distance precision shooting training
- Home Defense training
- Private, 1-on-1 firearms training
- Private group training

Our training calendar can be found at
https://www.spartanfirearmstraininggroup.com/events-calendar/

Paul Duffy can be contacted at 410-707-2992 or Paul@spartanftg.com.

WHEN FACING A LIFE-THREATENING EVENT, YOU WILL FALL TO THE LEVEL OF YOUR TRAINING, NOT RISE TO THE LEVEL OF YOUR EXPECTATIONS. TRAIN THE WAY YOU FIGHT!