

Grade 4 · Measuring and Adding Angles · Lesson

Common Core 4.MD.C.5, 4.MD.C.6, 4.MD.C.7 · mathovore.fr

An angle measures how far a ray turns around its endpoint. A full turn is 360 degrees, so a one-degree angle is $\frac{1}{360}$ of a circle. Use a protractor to measure angles in degrees. Angle measures add: if an angle is split into parts, the whole equals the sum, as in $35^\circ + 40^\circ = 75^\circ$.

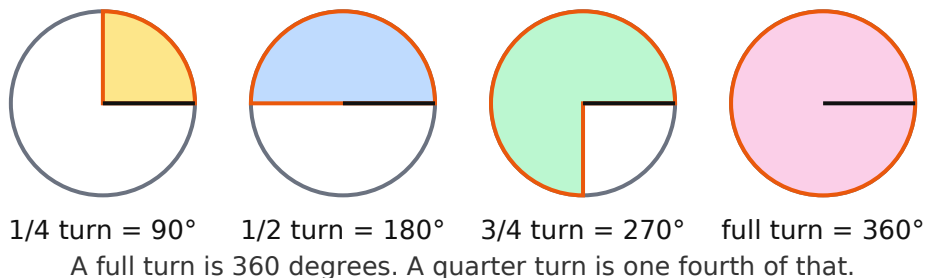
Grade 4 Common Core: 4.MD.C.5 · 4.MD.C.6 · 4.MD.C.7

Key facts:

- A one-degree angle turns through $\frac{1}{360}$ of a circle.
- A quarter turn is 90 degrees, a half turn is 180 degrees, and a full turn is 360 degrees.
- To use a protractor, put its center on the vertex and one ray on the 0 mark.
- The measure of a whole angle is the sum of the measures of its non-overlapping parts.
- Use a letter for an unknown angle and solve an addition or subtraction equation.

What is an angle and how is it measured?

An angle is made by two rays that share an endpoint called the vertex. Think of an angle as a turn: one ray swings around the vertex to a new position, and the size of the turn is the angle measure. A full turn brings the ray back to where it started. A circle is cut into 360 equal turns, called degrees.



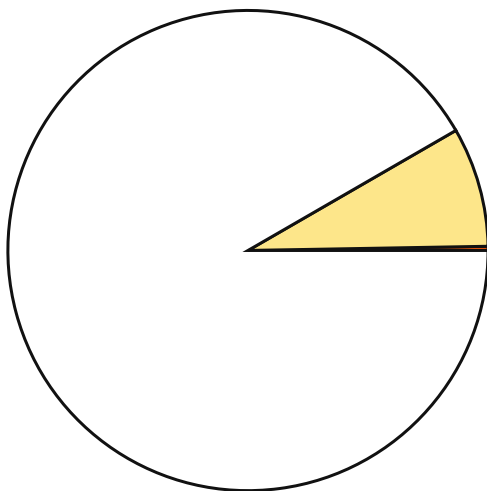
One-degree angle

A **one-degree angle** turns through $\frac{1}{360}$ of a circle. An angle that opens through n one-degree angles has a measure of n degrees. A quarter turn is 90° , a half turn is 180° , and a

full turn is 360° .

What does a one-degree angle look like?

Imagine a circular pizza cut into 360 thin slivers. Each sliver is a one-degree angle. Place 30 slivers side by side and the angle is 30° .

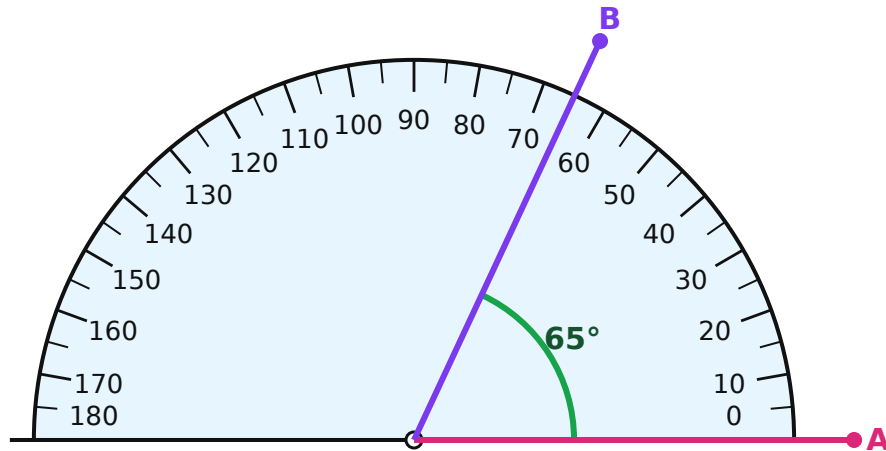


One slice of the circle is a one-degree angle. Thirty slices side by side make a 30 degree angle.

How do you measure an angle with a protractor?

1. Put the center mark of the protractor on the vertex of the angle.
2. Turn the protractor so one ray passes through the 0 mark on the baseline.
3. Read the number where the other ray crosses the scale that starts at 0.
4. Write the number with the degree symbol.

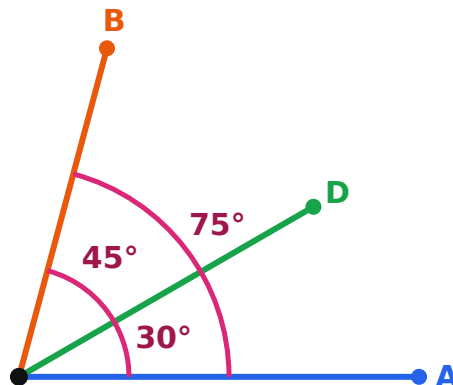
In the picture, ray A lies on the 0 mark and ray B crosses 65, so the angle measures 65° .



The ray through B crosses the scale at 65, so the angle measures 65 degrees.

How do you add and subtract angle measures?

Angle measures are additive. When an angle is split into parts that do not overlap, the whole angle equals the sum of the parts. A letter such as x can stand for an unknown angle.

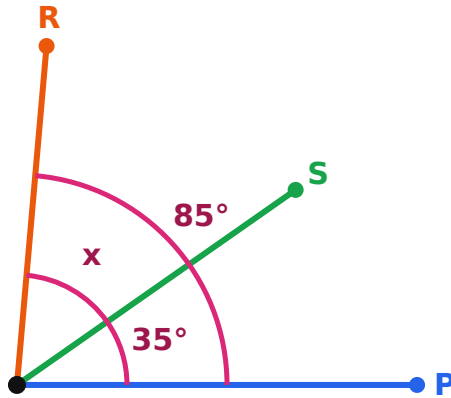


Ray D splits the angle into 30° and 45° parts. The whole angle is $30^\circ + 45^\circ = 75^\circ$.

Worked example

Angle PQR measures 85° . Ray QS splits it into a 35° angle and an angle x . Find x .

Write an equation: $35 + x = 85$. Subtract: $x = 85 - 35 = 50$. Check: $35 + 50 = 85$. The unknown angle is 50° .



The whole angle is 85° and one part is 35° . The other part is x .

Measuring and Adding Angles: frequently asked questions

What is an angle measure?

An angle measure tells how many one-degree angles fit in the turn between two rays. An angle that is 40 one-degree angles wide measures 40° .

Why does a circle have 360 degrees?

A circle is defined as a full turn, and a full turn is cut into 360 equal one-degree angles. Half of a circle is 180° and a quarter is 90° .

Which scale of the protractor should I read?

Read the scale that starts at 0 on the ray that lies on the baseline. If the baseline ray points right, use the scale that starts at 0 on the right. If it points left, use the other scale.

What if neither ray is on the 0 mark?

Read both rays on the same scale and subtract the smaller number from the larger one. Rays at 30° and 85° make an angle of 55° .

How do I find an unknown angle?

Write an equation with a letter for the unknown part, such as $35 + x = 85$, and then subtract the known part from the whole.