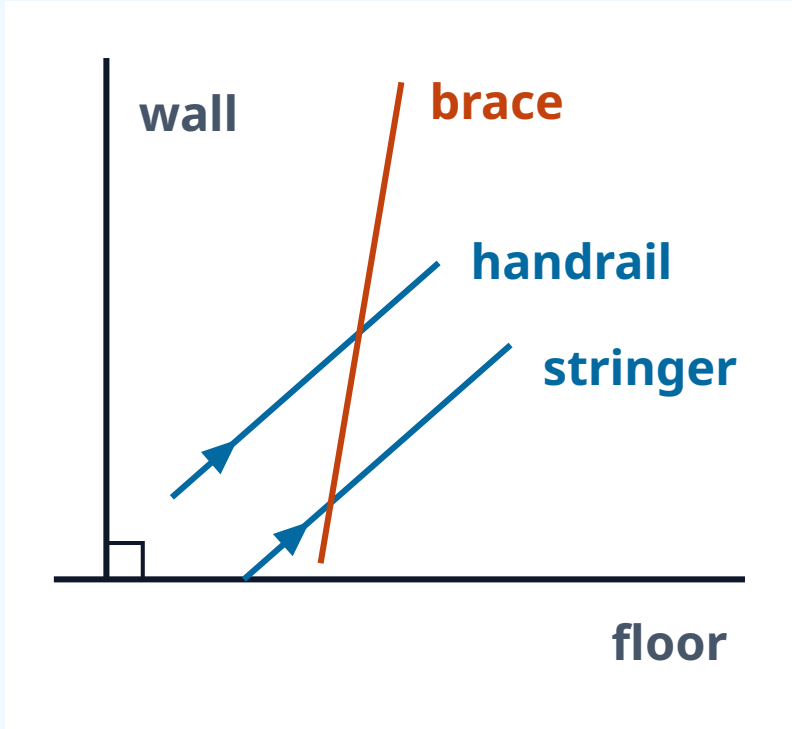
Mathematics 10-3

Unit G: Geometry and trigonometry

Parallel lines and transversals

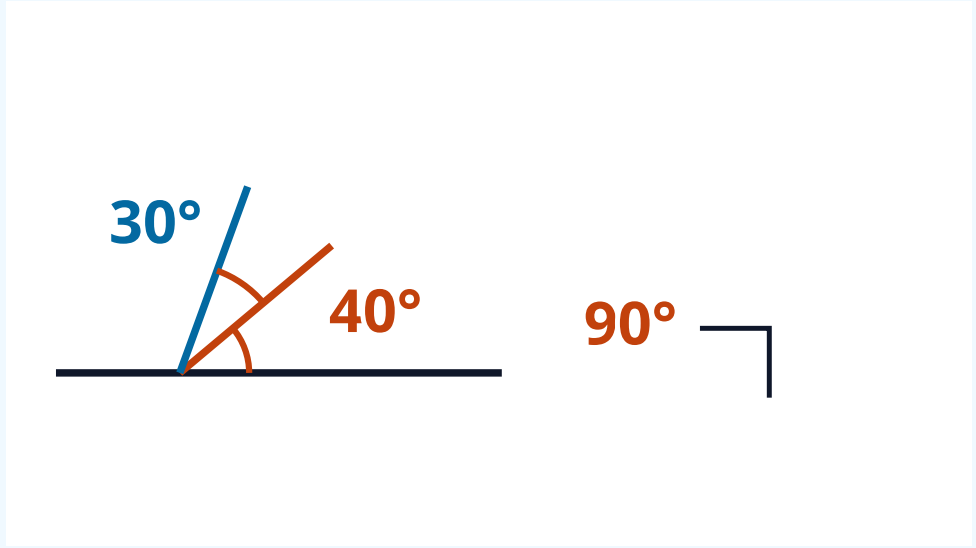
Parallel lines in a stair

- On a stair, the handrail runs the same way as the stringer, so those two lines are parallel.
- The wall meets the floor in a square corner, so the wall is perpendicular to the floor.
- A diagonal brace cuts across both lines.
- The brace is a transversal, a line that crosses two or more other lines.



Angle pairs on a crossing line

- Complementary angles add to 90 degrees.
- Supplementary angles add to 180 degrees.
- A transversal is the line that cuts across two others and makes a pair of angles at each crossing.
- When the two lines are parallel, corresponding angles match, and same-side interior angles add to 180 degrees.



Key terms

parallel lines

Lines that keep a steady gap, like a handrail and the stringer it follows. (||)

transversal

A line that crosses two or more other lines and creates pairs of angles at the crossings. (t)

corresponding angles

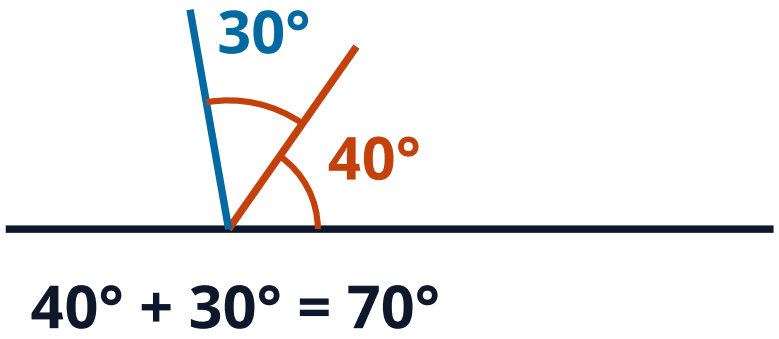
Angles that sit in the same corner at each crossing of a transversal, such as both upper-left angles. (F shape)

same-side interior angles

The two angles between the parallel lines and on the same side of the transversal. They add to 180 degrees. (sum 180)

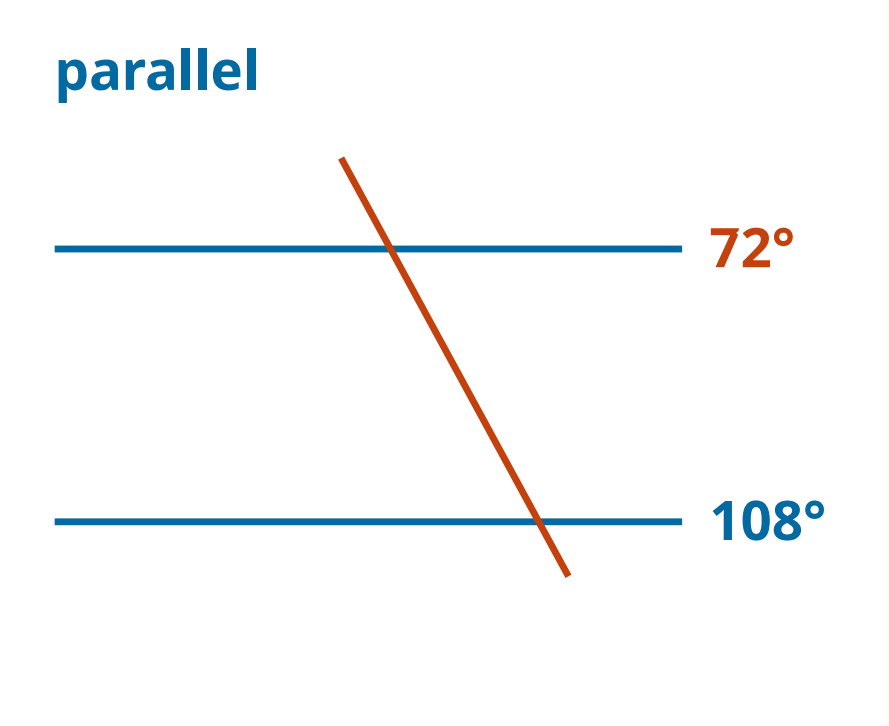
A 40 degree angle beside a 30 degree angle

- Two neighbouring angles measure 40 degrees and 30 degrees.
- Their sum is 70 degrees.
- A complementary pair needs 90 degrees and a supplementary pair needs 180 degrees, so this pair is a plain neighbouring pair.



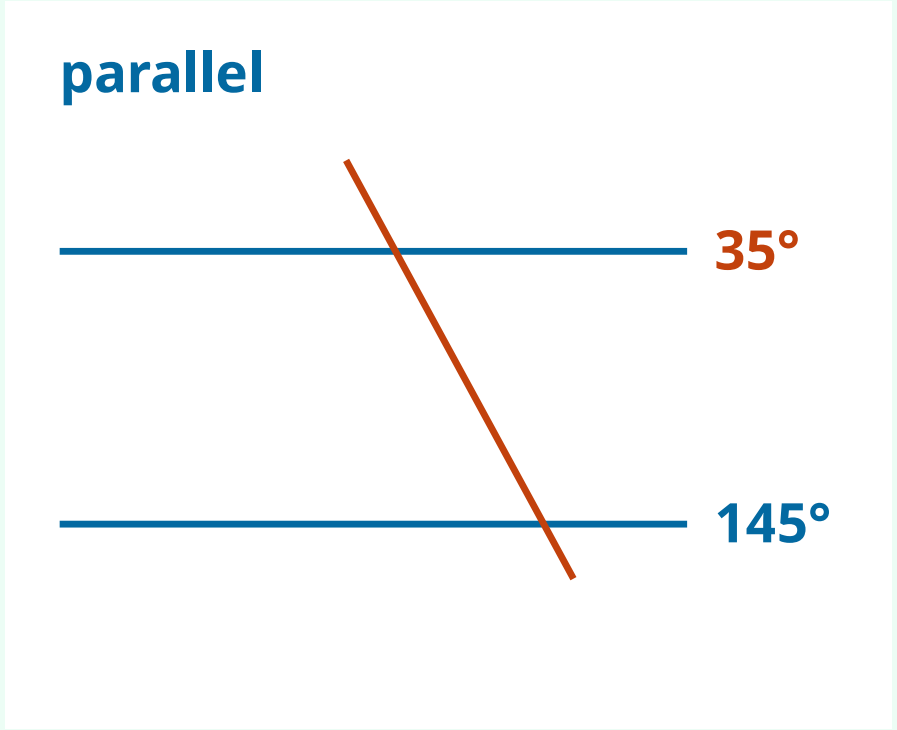
A 72 degree stair cut

- Two parallel rails are cut by a transversal, and one interior angle is 72 degrees.
- The corresponding angle and the alternate interior angle are also 72 degrees.
- The same-side interior angle is 180 minus 72, which is 108 degrees.



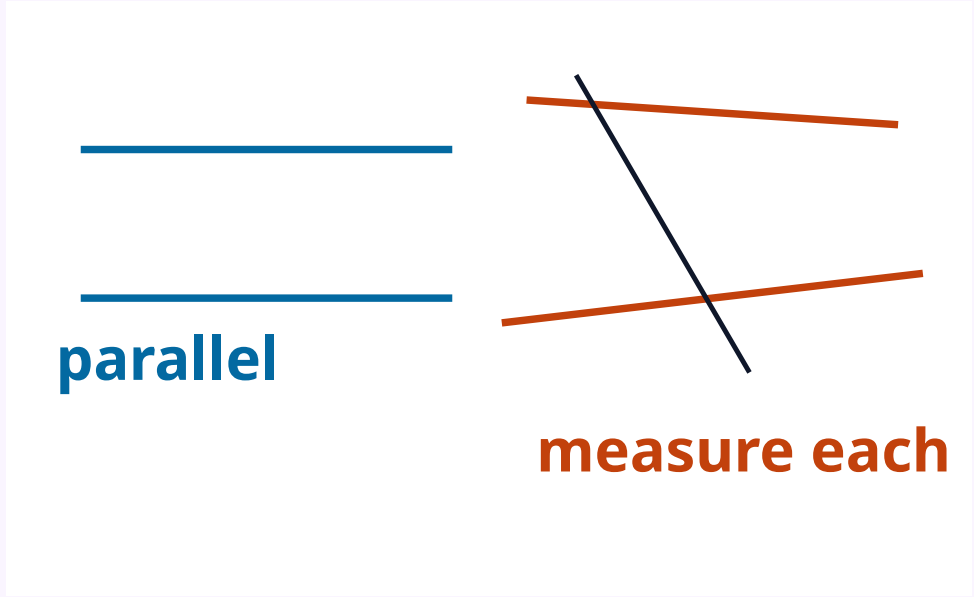
A 35 degree handrail

- A handrail is parallel to the stringer and a brace crosses it at 35 degrees.
- The angle that matches the 35 degree angle is 35 degrees.
- The same-side interior angle is 180 minus 35, which is 145 degrees.



When the rails leave the parallel test

- Equal corresponding angles and 180 degree same-side pairs belong to a parallel pair of lines.
- A tilted rail fails that parallel test, so each angle at the crossing gets its own protractor reading.
- A wall that stands square to the floor is perpendicular.
- The right angle there is 90 degrees.



Angle check

- A stair stringer meets a vertical post at 55 degrees, and the stringer is parallel to the handrail.
- Find the same-side interior angle.
- Sort a wall and a floor, a handrail and a stringer, and a diagonal brace.

