

# Angle Relationships and Unknown Angles

## Grade 7 math · Test · Standards: 7.G.B.5

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

This test has 8 questions worth 20 points on angle relationships and equations for unknown angles. Allow 45 minutes, write an equation when a question asks for one, and show every step. Angles are in degrees.

**Standards:** 7.G.B.5 · **Level:** Grade 7

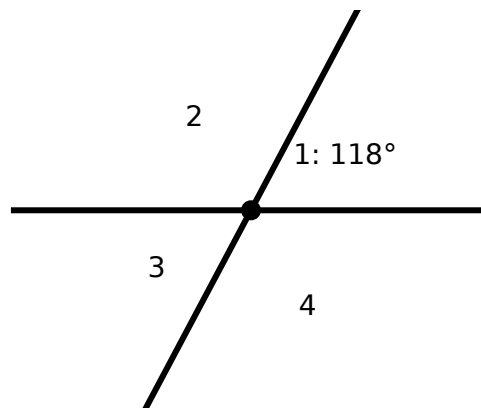
Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

### Question 1 Complement and supplement (2 points)

For an angle of  $29^\circ$ , calculate (a) its complement and (b) its supplement. (1 point each)

### Question 2 Crossing lines (3 points)

Two lines intersect as shown.  $\angle 1 = 118^\circ$ .



*Lines cross;  $\angle 1 = 118^\circ$ .*

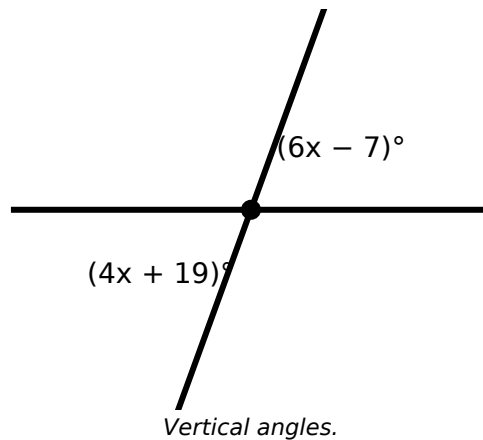
Find the measures of  $\angle 2$ ,  $\angle 3$  and  $\angle 4$  and name the relationship used for each. (3 points)

### Question 3 Supplementary expressions (2 points)

Two angles are supplementary and measure  $(3x + 14)^\circ$  and  $(2x + 16)^\circ$ . Find  $x$  and both angles.

### Question 4 Vertical angle equation (3 points)

In the figure the vertical angles measure  $(6x - 7)^\circ$  and  $(4x + 19)^\circ$ .



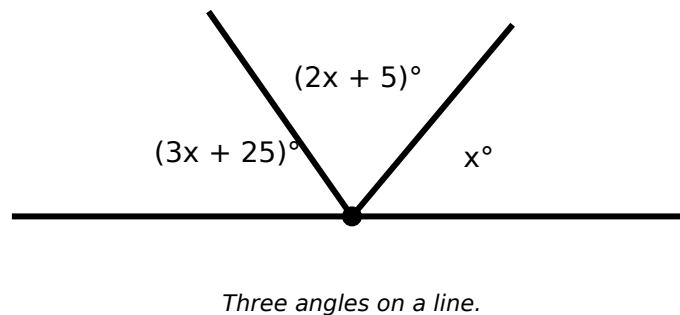
- Write an equation. (1 point)
- Solve for  $x$ . (1 point)
- Find the measure of each of the four angles. (1 point)

### Question 5 Classify and explain (2 points)

- (a) Classify each pair as complementary, supplementary or neither:  $28^\circ$  and  $62^\circ$ ;  $72^\circ$  and  $108^\circ$ . (1 point) (b) Explain why two obtuse angles cannot be supplementary. (1 point)

### Question 6 Angles on a line (3 points)

Solve for  $x$  and find all three angles on the straight line.



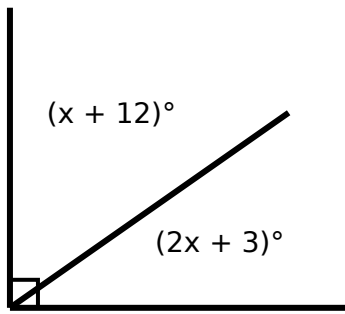
(3 points)

### Question 7 Comparing with its complement (3 points)

An angle measures  $6^\circ$  less than 5 times its complement. Write an equation, solve it, and state the angle and its complement. (3 points)

### Question 8 Split right angle (2 points)

A ray splits a right angle into angles of  $(2x + 3)^\circ$  and  $(x + 12)^\circ$ .



*A right angle split in two.*

Find  $x$  and both angles. (2 points)