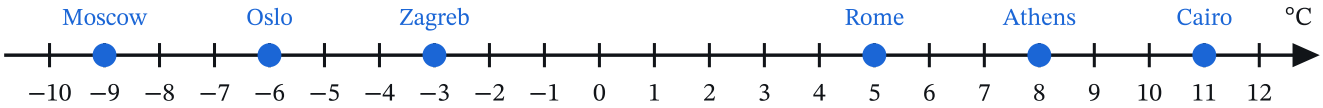
Names (pair) _____ Date _____

Distance on the Number Line

On one winter day these temperatures were measured at the same moment in capital cities. How far apart are the cities in temperature? The difference in temperature is the **distance** between two points on a thermometer, that is, on the number line.



1 IN PAIRS For each pair of cities, read the temperatures x and y. Count on the line how many degrees apart they are. Then work out the four expressions.

Cities	x	y	Distance on the line	$x+y$	$x-y$	$y-x$	$\lvert x-y\rvert$
Zagreb – Athens							
Athens – Rome							
Zagreb – Oslo							
Moscow – Zagreb							
Cairo – Moscow							
Oslo – Rome							
Always gives the distance?				☐	☐	☐	☐

2 IN PAIRS Tick, in the last row, the expression that gives the distance **in every row**. Then complete.

The distance between the numbers x and y on the number line is _____.

The expression $x - y$ gives the distance only when _____, and $y - x$ only when _____.

Names (pair) _____ Date _____

3 IN PAIRS Why does $x + y$ not give the distance? Show that it does give the right answer when one temperature is 0 °C and the other is above zero.

4 ON YOUR OWN Is $|x - y| = |y - x|$? Check two pairs from the table and explain using the number line.

5 ON YOUR OWN Match each expression to a sentence.

$\|x - 4\|$	●	● the distance of x from 0
$\|x + 2\|$	●	● the distance of x from -4
$\|x\|$	●	● the distance of x from 4 (two expressions)
$\|4 - x\|$	●	● the distance of x from -2
$\|x + 4\|$	●	

6 ON YOUR OWN In Zagreb the lowest temperature of the day was -4 °C and the highest 7 °C. Write the daily temperature range with an absolute value and work it out.

[ ] = [ ] °C

7 IN PAIRS CHALLENGE In Ljubljana the temperature differs from Zagreb's (-3 °C) by 2 °C. Write this as an equation with an absolute value. Which temperatures are possible?

[ ] → [ ]

The Number Line app · otooly.com/number-line

Points mode: place two temperatures and check how far apart they are; **Intervals** mode: type $|x + 3| = 2$.

★ ON YOUR OWN **Exit card.** Write the distance between -5 and 3 with an absolute value and work it out: [ ]