Unit 3 · Rational Numbers Cheat Sheet

Unit 3 focus: positive and negative numbers, the number line, comparing and ordering

1 KEY VOCABULARY

integer	A whole number or its opposite.	−4, 0, 7
opposites	Same distance from 0, opposite sides.	5 and −5
rational number	Can be written as a fraction of integers.	$-\frac{3}{4}$, 0.5, −2
absolute value	Distance from 0 (never negative).	|−8| = 8
ordered pair	(x, y) gives a point's location.	(−3, 2)

2 POSITIVE AND NEGATIVE IN CONTEXT

Situation	Number
10 feet below sea level	−10
A deposit of $25	+25
4 degrees below zero	−4
A gain of 6 yards	+6

3 COMPARING ON A NUMBER LINE

Numbers increase to the right. The number farther right is greater.

Example: Compare −7 and −3.
Position: −3 is to the right of −7
Answer: −7 < −3

4 ORDERING RATIONAL NUMBERS

Change to decimals, then place them on a number line.

Example: Order -1.5, $\frac{1}{2}$, $-\frac{3}{4}$, 0 from least to greatest.
Decimals: −1.5, 0.5, −0.75, 0
Answer: -1.5, $-\frac{3}{4}$, 0, $\frac{1}{2}$

5 INEQUALITY STATEMENTS

The temperature is at least −5°F.	**t ≥ −5**
The depth is less than −20 m.	**d < −20**
−2 is greater than −9.	**−2 > −9**

6 QUICK REMINDERS & COMMON MISTAKES

✔ Do remember

- Every negative number is less than every positive number.
- Opposites have the same absolute value.
- 0 is neither positive nor negative.

✘ Common mistakes

- −8 > −2 because 8 > 2: −8 is farther left, so −8 < −2
- |−6| = −6: distance is positive: 6
- Reading (x, y) as (y, x): x first: across, then up or down

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More practice: absolute value and the coordinate plane

1 ABSOLUTE VALUE

Count the distance from 0 on a number line.

Example: Find $|-12| + |5|$.
Distances: 12 and 5
Answer: 17

2 ABSOLUTE VALUE IN CONTEXT

An account balance of −$30 is a debt of …	**$30**
Which is farther from 0: −9 or 7?	**−9**
Elevation −45 m is how far below sea level?	**45 m**

3 THE FOUR QUADRANTS

Quadrant	Signs (x, y)
I	(+, +)
II	(−, +)
III	(−, −)
IV	(+, −)

Points on an axis are in no quadrant.

4 REFLECTIONS

Reflect over the x-axis: change the sign of y. Over the y-axis: change the sign of x.

Example: Reflect (4, −3) over the y-axis.
Change x: 4 → −4
Answer: (−4, −3)

5 DISTANCE ON A GRID

Same x or same y: subtract the other coordinates and take the absolute value.

Example: Distance from (2, −5) to (2, 3)?
Same x: $|3 - (-5)|$
Answer: 8 units

6 CHECK YOURSELF

- Did I use the number line to compare negatives?
- Is my absolute value a distance (not negative)?
- Did I move across (x) before up or down (y)?
- Does my sign match the context (above or below, gain or loss)?