Domain: The Number System

7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Calculator Availability: No

Choose the expression in each row that has the greater value.

Row 1	$-\frac{3}{4} \times 2$	$-\frac{1}{2} \times 2$
Row 2	-1.5×20	-2×30
Row 3	$(-10) \div (-0.3)$	$(-10) \div (0.2)$

Alignment: 7.NS.A.2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

Operating with rational numbers is an important part of the K–8 progression. The numbers and operations in this item were chosen to illustrate the grade-level expectation for multiplication and division with rational numbers in different forms. The expressions in this item are crafted so that students can leverage their knowledge of structure and the rules for operating with rational numbers to determine which has the greater value without executing any computations.

Coherence: Students should be given opportunities to work toward fluency throughout instruction. Students began developing computational strategies as early as kindergarten and continue to develop strategies through grade 7. This item extends the understanding developed around multiplication as scaling[5.NF.B.5] and the of concept of negative rational numbers[6.NS.C.6] to the full rational number system. In grade 7, students must apply and extend their understandings of negative numbers to compute with rational numbers of all forms. Computation with rational numbers supports grade 7 work with expressions and equations,[7.EE.A/B] and prepares students for work with computing with scientific notation,[8.EE.A.4] and understanding the work with irrational numbers.[8.NS.A]

Rigor: This item attends to conceptual understanding and procedural skill. Depending on how students approach this item, they may use conceptual understanding of multiplication and division of decimals and fractions, and the rules for multiplication and division with signed numbers, to reason about the resulting magnitude without actually computing. Alternatively, students have developed grade-level procedures for operating with rational numbers in different forms, including signed numbers, and may call upon those algorithms to compute. No calculator tool is provided to reinforce reasoning without computation.

Answer Key:

Choose the expression in each row that has the greater value.

Row 1	$-\frac{3}{4} \times 2$	$\boxed{-\frac{1}{2} \times 2}$
Row 2	$\boxed{-1.5 \times 20}$	-2×30
Row 3	$\boxed{(-10) \div (-0.3)}$	$(-10) \div (0.2)$

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