

Name: _____

Date: _____

Aim: How do we evaluate expressions with Rational Numbers?

Do Now:

Evaluate each expression.

<p>a) $-3.1 + 1.2$</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">-1.9</div>	<p>b) $-\frac{1}{4}(5)$</p> $-\frac{1}{4} \cdot \frac{5}{1}$ $-\frac{5}{4}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">$-\frac{1}{4}$</div>	<p>c) $-1\frac{1}{4} \times -\frac{2}{3}$</p> $-\frac{5}{4} \times -\frac{2}{3}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">$\frac{5}{6}$</div>
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Evaluating Algebraic Expressions

Evaluate each expression when $a = \frac{2}{3}$, $b = -6$, $c = 0.1$ and $d = -1.12$.

<p>a) $\frac{b}{a} = \frac{-6}{\frac{2}{3}}$</p> $-\frac{6}{1} \div \frac{2}{3}$ $-\frac{3}{1} \cdot \frac{3}{1}$ -9 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">-9</div>	<p>b) $ab - cd$</p> $\left(\frac{2}{3}\right)\left(-\frac{6}{1}\right) - (0.1)(-1.12)$ $-4 - (0.1)(-1.12)$ $-4 - (-0.112)$ $-4 + 0.112$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">-3.888</div>	<p>c) $b + \frac{d}{c}$</p> $-6 + \frac{-1.12}{0.1}$ $-6 + \frac{0.1 \cdot 1.12}{0.1 \cdot 0.1}$ $-6 + \frac{-1.12}{1}$ $-6 + -1.12$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">-17.2</div>
<p>d) $ab^2 - d$</p> $\left(\frac{2}{3}\right)(-6)^2 - (-1.12)$ $\left(\frac{2}{3}\right)\left(\frac{36}{1}\right)$ $24 - (-1.12)$ $24 + 1.12$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">25.12</div>	<p>e) ac</p> $\left(\frac{2}{3}\right)(0.1)$ $\left(\frac{2}{3}\right)\left(\frac{1}{10}\right)$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">$\frac{2}{30} \rightarrow \frac{1}{15}$</div>	

The order of operations holds true for ALL real numbers!

<p>f) $\frac{1}{2}\left(\frac{-1}{2} + \frac{4}{5}\right)$</p> $\frac{1}{2}\left(\frac{-5}{10} + \frac{8}{10}\right)$ $\frac{1}{2}\left(\frac{3}{10}\right)$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">$\frac{3}{20}$</div>	<p>g) $\frac{3}{2} \cdot -3\frac{1}{2} \div \frac{-6}{5}$</p> $\frac{3}{2} \cdot \frac{-7}{2}$ $-\frac{21}{4} \div \frac{-6}{5}$ $-\frac{21}{4} \cdot \frac{-5}{6} = \frac{35}{8}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">$4\frac{3}{8}$</div>	<p>h) $\frac{-5\frac{1}{2} \cdot 4}{-3\frac{1}{2} + \frac{1}{2}}$</p> $\frac{-11 \cdot 4}{-7 + \frac{1}{2}} = \frac{-22}{-\frac{6}{2}} = \frac{-22}{-3}$ $\frac{22}{3} \rightarrow 7\frac{1}{3}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">$7\frac{1}{3}$</div>
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Evaluate each of the following where $a = 3$, $b = -4$, $c = -\frac{1}{2}$.

i) $-3ab + c$
 $-3(3)(-4) + (-\frac{1}{2})$
 $36 + (-\frac{1}{2})$
 $35\frac{1}{2}$

j) $2b^2 - (-a)$
 $2(-4)^2 - (-3)$
 $2(16) - (-3)$
 $32 - (-3)$
 $32 + 3$
 35

Extra Practice

Use the order of operations to evaluate each expression.

k.) $\frac{1}{2} - (-\frac{1}{2})^2 + \frac{3}{7}$
 $\frac{1}{2} - \frac{1}{4} + \frac{3}{7}$
 $\frac{2}{4} - \frac{1}{4} + \frac{3}{7}$
 $\frac{1}{4} + \frac{3}{7}$
 $\frac{7}{28} + \frac{12}{28} = \frac{19}{28}$

l.) $[1\frac{1}{5} + (-1.2)](-5.4 + 1.2)$
 $1.2 + (-1.2)$
 $(0)(-5.4 + 1.2)$
 0

m.) $-3\frac{2}{5} \div (1\frac{1}{4} + \frac{-1}{2})$
 $\frac{5}{4} + \frac{-1}{2}$
 $\frac{5}{4} + \frac{-2}{4}$
 $-3\frac{2}{5} \div (\frac{3}{4})$
 $-\frac{17}{5} \cdot \frac{4}{3} = \frac{-68}{15} = -4\frac{8}{15}$

n.) $1.7 - [(2.1 + (-3.5))]^2$
 $1.7 - (-1.4)^2$
 $1.7 - 1.96$
 -0.26