Aim: swbat evaluate expressions using the correct order of operations

Do Now:
1. Check your hw answers

HW: WS: Packet p. 32 (order of operations)

Integer Test Friday, 10/4
September 24, 2019

**Aim:** swbat evaluate expressions using the correct order of operations

**Do Now:**
1. Check your hw answers

**HW:** Choose and Use 3 strategies to prepare for Friday's test!

Integer Test Friday, 10/4
### HW: Multiplying & Dividing Integers

- Remember to use the rules when completing this homework assignment.

#### Find the answer to the following.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6 (-8)</td>
<td>-48 ✓</td>
</tr>
<tr>
<td>2.</td>
<td>(-10)(-5)</td>
<td>50 ✓</td>
</tr>
<tr>
<td>3.</td>
<td>7(-9)</td>
<td>-63 ✓</td>
</tr>
<tr>
<td>4.</td>
<td>(-6)(13)</td>
<td>-78</td>
</tr>
<tr>
<td>5.</td>
<td>-144/12</td>
<td>-12</td>
</tr>
<tr>
<td>6.</td>
<td>-90 ÷ -15</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>(-15)(7)</td>
<td>-105</td>
</tr>
<tr>
<td>8.</td>
<td>8(-5)</td>
<td>-40</td>
</tr>
<tr>
<td>9.</td>
<td>-51 ÷ 3</td>
<td>-17</td>
</tr>
<tr>
<td>10.</td>
<td>80/5</td>
<td>-16</td>
</tr>
<tr>
<td>11.</td>
<td>-12 ÷ 6</td>
<td>-2</td>
</tr>
<tr>
<td><strong>CHALLENGE</strong></td>
<td>12. (-4)(-2)(2)</td>
<td>16</td>
</tr>
</tbody>
</table>

#### Read the word problem, write a mathematical sentence and solve.

13) Mark and two friends went out to lunch. The total cost of lunch was $48. If the friends agree to split the bill equally, how much does each person pay for lunch?

\[ \frac{48}{3} = 16 \]

They each pay $16.
AIM: SWBAT evaluate expressions using the correct order of operations.

Order of Operations
PEMDAS

P → Parentheses: Do all operations within grouping symbols first; start with the innermost grouping symbols

E → Exponents

M/D → Do all multiplications and divisions in order from left to right. (Whichever comes first)

A/S → Do all additions and subtractions in order from left to right. (Whichever comes first)

NOTE: Sometimes expressions are written with a fraction bar to indicate division.

Example: 
\[
\frac{(48 - 24)}{(-2 + 8)} \text{ Means } (48 - 24) \div (-2 + 8)
\]

Evaluate the numerator.
\[
\frac{24}{6}
\]
Evaluate the denominator.
Last step Divide.
\[
4
\]

Evaluate each step-by-step:
1) \[
\frac{-18 - 2}{-1 + 6}
\text{ division}
\]
\[
\frac{-20}{5} = -4
\]
2) \[
\frac{-45 + 3}{-6 - 1}
\]
\[
\frac{-42}{-7} = 6
\]

State the first operation you would use to evaluate the following examples.
1) (25 - 11) • 3 Subtract
2) 150 ÷ (6 + 3 • 8) - 5 Multiply
3) 5 • 8 + 6 - 6 - 12 • 2 Multiply
4) \[
\frac{14 - 5}{4 + 2}
\text{ subtract}
\]
AIM: SWBAT evaluate expressions using the correct order of operations.

Order of Operations
PEMDAS

P → Parentheses: Do all operations within grouping symbols first; start with the innermost grouping symbols

E → Exponents

M/D → Do all multiplications and divisions in order from left to right. (Whichever comes first)

A/S → Do all additions and subtractions in order from left to right. (Whichever comes first)

NOTE: Sometimes expressions are written with a fraction bar to indicate division.

Example: \( \frac{(48 - 24)}{(-2 + 8)} \)

Means → \( (48 - 24) ÷ (-2 + 8) \)

Evaluate the numerator. 24
Evaluate the denominator. 6
Last step Divide. 4

Evaluate each step-by-step:

1. \( \frac{-18 - 2}{-1 + 6} \)
   - \( \frac{-20}{5} = -4 \)

2. \( \frac{-45 + 3}{-6 + 1} \)
   - \( \frac{-42}{-7} = 6 \)

State the first operation you would use to evaluate the following examples.

1) \((25 - 11) ÷ 3\) Subtract

2) \(150 ÷ (6 + 3 ÷ 8) - 5\) Multiply

3) \(5 ÷ 8 ÷ 6 ÷ 12 ÷ 2\) Multiply

4) \(\left(\frac{14 - 5}{4 + 2}\right)\) Subtract
Evaluate each expression using the correct order of operations. (P - E - MD - AS)
Show all work step-by-step.

1) \(144 \div 12 \cdot 5 \div 10\)
2) \(-6 \cdot 6 + 5\)
3) \((-82 + 7) \div (-5 \cdot 5)\)

4) \(\frac{-12 - 3}{-2 + 7}\)
5) \(120 \div [(-6 + 2) \cdot 3]\)
6) \(-7 \cdot 3 - 2 + 4\)

Describe and correct the error made in the solution:

\[
\begin{array}{l}
3 \cdot 3 + 63 \div 9 \\
9 + 63 \div 9 \\
72 \div 9 \\
8
\end{array}
\quad
\begin{array}{l}
Show the correct way to solve:
3 \cdot 3 + 63 \div 9 \\
9 + 63 \div 9 \\
9 + 7 = 16
\end{array}
\]
Evaluate each expression using the correct order of operations. (P – E – MD – AS)
Show all work step-by-step.

1) \(144 \div 12 \times 5 \div 10\)
   \(= \frac{12 \times 5}{10}\)
   \(= \frac{60}{10}\)
   \(= 6\)

2) \(-6 \times 6 + 5\)
   \(-36 + 5\)
   \(-31\)

3) \((-82 + 7) \div (-5 \times 5)\)
   \((-75 \div -25)\)
   \((-3)\)

4) \(-\frac{12 - 3}{2 + 7}\)
   \(-\frac{15}{9}\)
   \(-3\)

5) \(120 \div (-6 + 2) \times 3\)
   \(120 \div (-4) \times 3\)
   \(-10\)

6) \(-7 + 3 - 2 + 4\)
   \(-6 + 4\)
   \(-2\)

Describe and correct the error made in the solution:

\[3 \times 3 + 63 \div 9\]
\[9 + 63 \div 9\]
\[72 \div 9\]
\[8\]

**divide before addition**

Show the correct way to solve:

\[3 \times 3 + 63 \div 9\]
\[9 + 63 \div 9\]
\[9 + 7\]
\[16\]
Homework - Order of Operations

Evaluate each expression using the correct order of operations. (P - E - MD - AS)
Show all work step-by-step.

EXAMPLE: \(12 - 16 \div 2 + 5\)

\[
\begin{align*}
12 - 8 + 5 \\
4 + 5 \\
9
\end{align*}
\]

1) \(27 - 21 \div 3 + 5\) (divide, subtract, add)

2) \(47 + 14 \div 2 \cdot 3 - 18\) (divide, multiply, add, subtract)

3) \(3 \cdot 3 + 63 \div 9\)

4) \(56 \div (27 + 12 - 31)\)
Homework - Order of Operations

Evaluate each expression using the correct order of operations. (P - E - MD - AS)
Show all work step-by-step.

**EXAMPLE:**  
12 - 16 ÷ 2 + 5

\[
\begin{align*}
12 - 8 + 5 \\
4 + 5 \\
9
\end{align*}
\]

<table>
<thead>
<tr>
<th></th>
<th>1) 27 - 21 ÷ 3 + 5</th>
<th>2) 47 + 14 ÷ 2 • 3 - 18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27 - 7 + 5</td>
<td>47 + 7 \cdot 3 - 18</td>
</tr>
<tr>
<td></td>
<td>20 + 5</td>
<td>47 + 21 - 18</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>68 - 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>3) 3 • 3 + 63 ÷ 9</th>
<th>4) 56 ÷ (27 + 12 - 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 + 63 ÷ 9</td>
<td>56 ÷ (39 - 31)</td>
</tr>
<tr>
<td></td>
<td>9 + 7</td>
<td>56 ÷ 8</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td><strong>7</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>5) 27 - 6 • 12 • 3</th>
<th>6) (2³ + 2) • 6 ÷ 3 - 24 ÷ 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27 - 6 + 36</td>
<td>(8 + 2) • 6 ÷ 3 - 24 ÷ 8</td>
</tr>
<tr>
<td></td>
<td>21 + 36</td>
<td>10 • 6 ÷ 3 - 24 ÷ 8</td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>60 ÷ 3 - 24 ÷ 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 - 24 ÷ 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>
### Extra Practice

**Orders of Operations**: Perform the operations. (Show work)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) $5 \times (8 - 4) + 7$</td>
<td>2) $(12 - 4) \div (2 \times 2)$</td>
<td>3) $13 - 6 + 5$</td>
</tr>
<tr>
<td>4) $5 \times 6 - 3$</td>
<td>5) $(17 - 3) \div 7$</td>
<td>6) $4 \times 3 - 2 \times 5$</td>
</tr>
<tr>
<td>7) $56 \div 7 \times 3$</td>
<td>8) $2 \times 5 - (16 \div 4 + 2)$</td>
<td>9) $3 \times (15 - 8)$</td>
</tr>
<tr>
<td>10) $21 \div (49 \div 7) + 1$</td>
<td>11) $6 \times (3 \times 4) + 2$</td>
<td>12) $(17 - 9) \times 4 - 1$</td>
</tr>
</tbody>
</table>
### Order of Operations: Perform the operations. (Show work)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) $5 \times (8 - 4) + 7$</td>
<td>2) $(12 - 4) \div (2 \times 2)$</td>
<td>3) $13 - 6 + 5$</td>
</tr>
<tr>
<td>$5 \times 4 + 7$</td>
<td>$8 \div 4$</td>
<td>$17 + 5$</td>
</tr>
<tr>
<td>$20 + 7$</td>
<td>$2$</td>
<td>$12$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) $5 \times 6 - 3$</td>
<td>5) $(17 - 3) \div 7$</td>
<td>6) $4 \times 3 - 2 \times 5$</td>
</tr>
<tr>
<td>$30 - 3$</td>
<td>$14 \div 7$</td>
<td>$12 - 2 \times 5$</td>
</tr>
<tr>
<td>$27$</td>
<td>$2$</td>
<td>$12 - 10$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) $56 \div 7 \times 3$</td>
<td>8) $2 \times 5 - (16 - 4 + 2)$</td>
<td>9) $3 \times (15 - 8)$</td>
</tr>
<tr>
<td>$8 \times 3$</td>
<td>$2 \times 5 - (14 + 2)$</td>
<td>$3 \times 7$</td>
</tr>
<tr>
<td>$24$</td>
<td>$2 \times 5 - 2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$10 - 2 = 8$</td>
<td>$21$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) $21 \div (49 \div 7) + 1$</td>
<td>11) $6 + (3 \times 4) + 2$</td>
<td>12) $(17 - 9) \times 4 - 1$</td>
</tr>
<tr>
<td>$21 \div 7 + 1$</td>
<td>$6 + 12 + 2$</td>
<td>$8 \times 4 - 1$</td>
</tr>
<tr>
<td>$3 + 1$</td>
<td>$18 + 2$</td>
<td>$32 - 1$</td>
</tr>
<tr>
<td></td>
<td>$20$</td>
<td>$31$</td>
</tr>
</tbody>
</table>
Perform the operations inside the parenthesis first:

37) $(3 + -4) + 2 =
38) (8 - 6) + -4 =
39) 9 + (3 - 7) =

40) (-1 + -7) + 6 =
41) 2 + (3 - 10) =
42) 1 - (6 + 4) =

43) -10 + (-3 - 5) =
44) 5 - (-8 + 7) =
45) -2 - (-2 -2) =
CHOICE

1. IXL  C.1  or  C.2  or  C.3

2. KAHOOT
   KAHOOT ADDING AND SUBTRACTING INTEGERS
   Kahoot adding and subtracting integers 2

3. INTEGER NUMBER LINE SLIDER BOARDS

4. QUIZ CORRECTIONS (on looseleaf)