Integers, Opposites, Absolute Value

Objectives:

...to represent, graph, compare and order integers
...to find opposites and absolute values
...to evaluate expressions containing absolute value

Assessment Anchor:

7.A.3.2 – Compute accurately with and without use of a calculator

THE NUMBER LINE

NOTES

Definitions:

ABSOLUTE VALUE – the distance a number is from “ZERO” on the number line

1. Symbol is | |
2. Absolute value is always a positive value

OPPOSITES – numbers that have the same absolute value

INTEGERS – all whole numbers and their opposites

Places where negative numbers are used:

________________ , __________________ , __________________ , __________________ , __________________ , __________________ , __________________ , __________________
**Integers, Opposites, Absolute Value**

Representations using integers:

<table>
<thead>
<tr>
<th>Situation</th>
<th>Integer</th>
<th>Situation</th>
<th>Integer</th>
</tr>
</thead>
<tbody>
<tr>
<td>the loss of 5 yards</td>
<td>-5</td>
<td>A gain of 45 yards</td>
<td></td>
</tr>
<tr>
<td>19 degrees below zero</td>
<td>-19</td>
<td>12 degrees above zero</td>
<td></td>
</tr>
<tr>
<td>A profit of 400 dollars</td>
<td>400</td>
<td>A loss of 29 dollars</td>
<td></td>
</tr>
<tr>
<td>A debt of 250 dollars</td>
<td>-250</td>
<td>a surplus of 25 computers</td>
<td></td>
</tr>
<tr>
<td>100 feet below sea level</td>
<td>-100</td>
<td>4,000 feet above sea level</td>
<td></td>
</tr>
<tr>
<td>a decrease of 18 degrees</td>
<td></td>
<td>An increase of 10 degrees</td>
<td></td>
</tr>
<tr>
<td>An increase of 20 students</td>
<td></td>
<td>A decrease of 34 students</td>
<td></td>
</tr>
<tr>
<td>A gain of 56 yards</td>
<td></td>
<td>A loss of 11 yards</td>
<td></td>
</tr>
<tr>
<td>8 strokes under par</td>
<td></td>
<td>3 strokes over par</td>
<td></td>
</tr>
<tr>
<td>32 degrees above zero</td>
<td></td>
<td>25 degrees below zero</td>
<td></td>
</tr>
<tr>
<td>A profit of $10</td>
<td></td>
<td>A debt of $300</td>
<td></td>
</tr>
</tbody>
</table>

Comparing integers: (using =, >, <)

-3 > -5  -2 < 1  -8 < -6  -7 < 3

-9 7  -8 -10  0 -6 -3 -14

-8 -1  -5 1  -6 -20  0 -4,000

Ordering integers:

<table>
<thead>
<tr>
<th>Original list of integers</th>
<th>Ordered least to greatest</th>
</tr>
</thead>
<tbody>
<tr>
<td>-8, -4, -10, -7, 1</td>
<td>-10, -8, -7, -4, 1</td>
</tr>
<tr>
<td>11, -4, 0, -3, 9, -9, -1</td>
<td>-9, -4, -3, -1, 0, 9, 11</td>
</tr>
<tr>
<td>-13, 11, 7, -4, -2</td>
<td></td>
</tr>
<tr>
<td>3, -4, -9, -1, -2</td>
<td></td>
</tr>
<tr>
<td>22, -31, -10, -4, 18</td>
<td></td>
</tr>
<tr>
<td>-35, -29, 22, -12, 0</td>
<td></td>
</tr>
</tbody>
</table>
Integers, Opposites, Absolute Value

Opposites and Absolute Values:

The opposite of -7 is 7. The opposite of 18 is -18.

The opposite of 10 is _____. The opposite of -3 is _____.

The opposite of -30 is _____. The opposite of 22 is _____.

| -4 | = 4
|  0 | = 0
| -7 | = _____
| -10 | = _____
| -31 | = _____
|  22 | = _____
|  6 | = _____
| -12 | = _____

The opposite of | -4 | is _____. The opposite of | 5 | is _____.

The opposite of - | 9 | is _____. The opposite of - | -10 | is _____.

- | -2 | = _____
- | 14 | = _____
- |  3 | = _____
- | -38 | = _____
| -30 | = _____
- (- | -5 | ) = _____

Evaluating expressions involving absolute values:

Absolute value symbols act like parenthesis!...and should be done ____!

1) Evaluate the following using: $x = -8, y = 12$

A) $19 - |x| \cdot 2$

B) $23 + |-y| \div 4$
2) Evaluate the following using: $a = -9, \ b = -4$

A) $| -30 | - | b |$  
B) $30 \times | a | - 40$

3) Evaluate the following using: $m = -6, \ p = 8$

A) $\frac{48}{|p|}$  
B) $\frac{p - |m|}{2}$