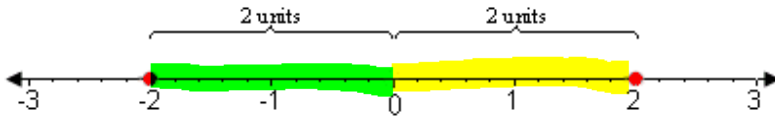# 1.2 Integers

Absolute Value: The ==absolute value== of a real number is its ==distance from 0== on the number line.

The numbers 2 and -2 are both 2 units away from 0.

That is, $|2| = 2$ and $|-2| = 2$.

==The absolute value of a real number is never negative!==

Examples: $|5| =$ 5 $|-5| =$ 5 $|1.2| =$ 1.2 $|-2.5| =$ 2.5 $|0| =$ 0

Operations with integers:

Adding Integers:
- o Same signs – add and keep the sign
- o Different signs – subtract their absolute values and take the sign of the number with the larger absolute value

Subtracting Integers:
- o Change the problem to addition using these rules:
    $$a - b = a + (-b)$$
    $$a - (-b) = a + b$$
    $$-a - b = -a + (-b)$$
    $$-a - (-b) = -a + b$$
- o Use the rules for adding integers (above)

Examples:

Perform the following operations:

1. 8 + (-3) = 5

2. 6 + (-6) = 0

3. -4 + (-6) = -10

4. 14 – 75 + 17 = -61 + 17 = -44

5. -17 + (-25) = -42

6. 28 + 44 = 72

7. 6 – (-10) = 6+10 = 16

8. -7 – 4 = -7 + (-4) = -11

9. -8 – (-3) = -8 + 3 = -5

10. -79 – 114 = -79 + (-114) = -193

11. -197 – 216 = -197 + (-216)
= -413

12. -22 – (-18) + 4 = -22 + 18 + 4
= -4 + 4 = 0

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$$a - (-b) = a + b$$
$$a - b = a + (-b)$$

Multiplying and Dividing Integers:

- Multiply or divide "normally"
- If multiplying/dividing two numbers – same signs means positive answer, different signs means negative answer
- For more than two numbers – even number of negative signs means the answer is positive, odd number of negative signs means a negative answer

Examples:

Perform the following operations:

1. -8(2) $= -16$

2. 15(-8) $= -120$

3. -12(-10) $= 120$

4. (-14)(-27)(0) $= 0$

5. 25(12) $= 300$

6. 97(-3) $= -291$

7. 4(-4)(-5) $= 80$

8. -2(-3)(-4)(-5) $= 120$ $(-2)(-3)(-4)$ $= -24$

9. -36 ÷ 6 $= -6$

10. -63 ÷ (-9) $= 7$

11. 0 ÷ 5 $= 0$

12. -72 ÷ 9 $= -8$

$0 \div 5 = 0$

$5 \div 0$ is undefined