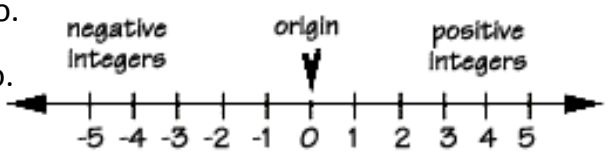
**NOTES: 3.1 (Unit 3, Lesson 1)** Name:_____

# Integers and Absolute Value

- An integer is any positive or negative whole number from the set {…,–4,–3 –2 –1, 0, 1, 2, 3, 4,…}
- Negative integers are integers _____ than zero.
- Positive integers are integers _____than zero.
- _____ is neither negative nor positive.




These numbers are **Integers**: 0, 3, –100, 432, $\frac{10}{2}$, $-\frac{6}{3}$, 987,654,321

These numbers are **not Integers**: 7.2, $\frac{10}{4}$, $-\frac{5}{8}$, – 3.7

## Write Integers for Real-Life Situations

a gain of 5 yards on the first down.

6 feet below sea level

a temperature of 10 degrees below zero.

a $35 withdrawal

***You Try! Underline key words***

**a.** Lost 6 points

**b.** 3 stokes below par

**c.** $5 deposit

**d.** A loss of $30

**e.** descend 20 meters

**f.** 12 centimeters longer

**h.** 5000 feet above sea level

**i.** 7 inches below normal

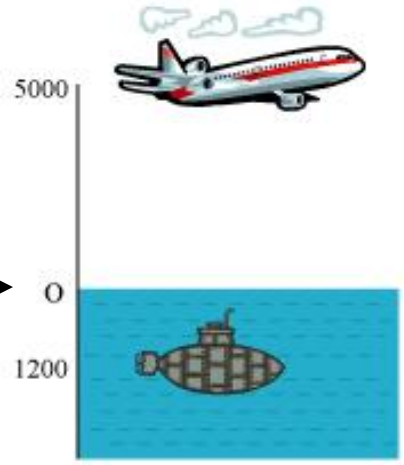
**j.** $5 off the original price

**k.** ascend 100 meters

**l.** 10 strokes above par

**m.** 6 yard loss

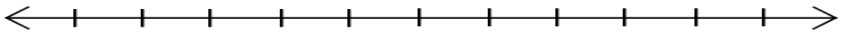
**g.** How far away is the plane from the submarine?




**h.** 100 meters ascend and then 20 meters descend

## Graph an Integer on a Number Line

Graph –4 on a number line. Then graph 3 on a number line. Which one is greater????



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## Compare Integers

**Use the > , <, or = to make a true sentence.**

–6 ◯ –4



**a.** 3 ◯ –5

**b.** –5 ◯ 0

**c.** 6 ◯ –1

**d.** –23 ◯ –29

**Positive** numbers are always _____ than **negative** numbers.

**Zero** is always _____ than a positive number, but _____ than a negative number.

When comparing **two negative** numbers, imagine them on a number line. The negative number closer to the zero is always _____.

## Order Integers

**SCIENCE** The average surface temperatures of Jupiter, Mars, Earth, and the Moon are shown in the table. Order the temperatures from least to greatest (in ascending order).

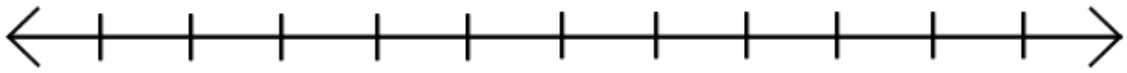
| Name | Average Surface Temperature (°F) |
|---|---|
| Jupiter | –162 |
| Moon | –10 |
| Mars | –81 |
| Earth | 59 |

# Absolute Value

- The _____ of an integer is the _____that number is from _____ on a number line. (# of steps from zero)
- The absolute value of any number is **ALWAYS** _____ , or _____.

$$|14| = |-14| = 14$$

Evaluate and Graph the expression. $|-4|$



**a.** $|6|$ =  **b.** $|4| + |-4|$ =  **c.** $|-7| - |2| + |-1|$ =

**d.** $|-5|$ =  **e.** $|9| - |-5|$ =  **f.** $|-13| + |-7|$ =

**Record the absolute value for each integer.**

1) $|-8|$ =  2) $|5|$ =

3) $|15|$ =  4) $|-13|$ =

**Evaluate the problems below.**

5) $|-22| + 9$ =  6) $|10| - |-4|$ =

7) $|7| \cdot 9 \cdot |0|$ =  8) $|-100| \div |5|$ =

**Compare, using <, >, or =**

9) 6 ◯ $|-14|$  10) $|-17|$ ◯ $|17|$

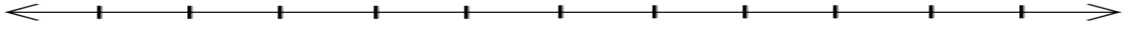
**Order the following from GREATEST to LEAST (descending order).**

11) $-32, -10, |16|, |-3|, |-30|, 25$ _____

## Additive Inverses

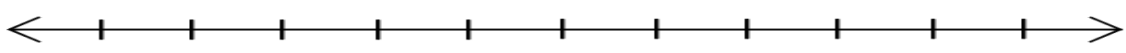
Additive inverses are numbers that are the _____ distance from zero in _____ directions on the number line. When additive inverses are combined through addition, the sum is ZERO.

Write the Additive Inverse of 3. _____ Graph 3 and its additive inverse on the number line.



**Write the additive inverse of each number. Graph each pair on the number line.**

**a.** –4  **b.** 8  **c.** –9



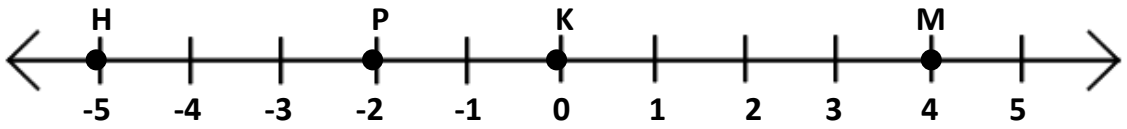
**Practice (1.1)** Name:_____

**Write an integer to represent the situation below:**

1) sea level _____ 2) a withdraw of 42 dollars _____

3) 14 degrees below 0 _____ 4) an increase in height of 3 inches _____

**Write the value represented by the point for each letter. Then find its additive inverse (a.i.).**




5) K _____, a.i.: _____ 6) H _____, a.i: _____

7) M _____, a.i: _____ 8) P _____, a.i: _____

**Evaluate**

9) |29| = 10) |–15| =

11) |9| – |–2| = 12) |–50| + |–7| =

13) What is the sum of the absolute values of –14 and 10? _____

14) |–30| – |–4|+ |5| =

**Compare using > , < , or =**

15) -32 ◯ 14 16) 11 ◯ –4 17) |–9| ◯ |9|

**Order the following from least to greatest (ascending order).**

18) –8, 10, 2, –13, –5, 3 _____

19) –22, –11, |11|, |0|, |–14|, 22, –10 _____

**Order the following from greatest to least (descending order).**

20) –9, –19, 19, 99, –29, –99, 29 _____

**??? Why is it better to have a positive bank account rather than a negative bank account?**

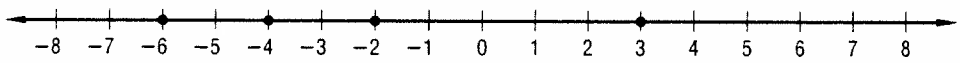
NAME _____ DATE _____ PERIOD _____

# 2-1 Study Guide and Intervention

## *Integers and Absolute Value*

The set of **integers** can be written {..., −3, −2, −1, 0, 1, 2, 3, ...} where ... means continues indefinitely. Two integers can be compared using an **inequality**, which is a mathematical sentence containing < or >.

**Example 1** **Use the integers graphed on the number line below for each question.**




**Replace each ○ with < or > to make a true sentence.**

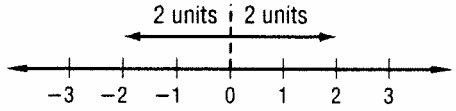
**a. −6 ○ −2**

−2 is greater since it lies to the right of −6.
So write $-6 < -2$.

**b. 3 ○ −4**

3 is greater since it lies to the right of −4.
So write $3 > -4$.

Numbers on opposite sides of zero and the same distance from zero have the same **absolute value.**




The symbol for absolute value is two vertical bars on either side of the number. $|2| = 2$ and $|-2| = 2$

**Example 2** **Evaluate each expression.**

**a. $|-4|$**

$|-4| = 4$

**b. $|-3| + |6|$**

$|-3| + |6| = 3 + 6$ $|-3| = 3, |6| = 6$

$= 9$ Simplify.

**Exercises**

**Replace each ○ with <, >, or = to make a true sentence.**

**1.** 4 ○ −4 **2.** 8 ○ 12 **3.** −7 ○ −5 **4.** 2 ○ 5

**5.** −1 ○ 1 **6.** 4 ○ −3 **7.** 6 ○ 8 **8.** −2 ○ 12

**9.** 9 ○ −1 **10.** −6 ○ −6 **11.** 5 ○ −3 **12.** −10 ○ 2

**Evaluate each expression.**

**13.** $|-6|$ **14.** $|15|$ **15.** $|-12|$ **16.** $|21|$

**17.** $|4| - |2|$ **18.** $|-8| + |-3|$ **19.** $|-10| - |-6|$ **20.** $|12| + |-4|$

Lesson 2-1

NAME _____ DATE _____ PERIOD ____

2-1

# Skills Practice

## *Integers and Absolute Value*

**Replace each ● with <, >, or = to make a true sentence.**

| | | | |
|---|---|---|---|
| **1.** 1 ● 0 | **2.** −3 ● 0 | **3.** 0 ● −1 | **4.** 0 ● 9 |
| **5.** −7 ● −7 | **6.** 2 ● −2 | **7.** −2 ● 8 | **8.** −4 ● 4 |
| **9.** 5 ● 5 | **10.** 0 ● −6 | **11.** 4 ● 10 | **12.** 6 ● −6 |
| **13.** 3 ● 7 | **14.** −1 ● −2 | **15.** 3 ● 4 | **16.** −3 ● −4 |

**Order the integers in each set from least to greatest.**

| | | |
|---|---|---|
| **17.** {4, −5, 0} | **18.** {8, −2, 1} | **19.** {−6, −3, 0} |
| **20.** {−5, 5, 3, −1} | **21.** {0, −3, 7, −2} | **22.** {9, −11, 1, 0} |
| **23.** {12, −4, 3, −1} | **24.** {−8, 15, 1, −10} | **25.** {−12, −17, −20, 2} |

**Evaluate each expression.**

| | | |
|---|---|---|
| **26.** $\|1\|$ | **27.** $\|-10\|$ | **28.** $\|-8\|$ |
| **29.** $\|10\|$ | **30.** $\|4\| + \|-4\|$ | **31.** $\|9\| - \|-5\|$ |
| **32.** $0 + \|-1\|$ | **33.** $\|-6\| + \|-5\|$ | **34.** $\|-8\| - \|-8\|$ |
| **35.** $\|12\| + \|-3\|$ | **36.** $\|-15\| - \|6\|$ | **37.** $\|-13\| + \|-7\|$ |

**Evaluate each expression if $a = -3$, $b = 0$, and $c = 1$.**

| | | |
|---|---|---|
| **38.** $\|a\| - b$ | **39.** $\|c\| + 2$ | **40.** $9 - \|a\|$ |
| **41.** $\|25\| - b$ | **42.** $10 - \|b\|$ | **43.** $\|-8\| + \|a\|$ |

NAME _____ DATE _____ PERIOD ____

# 2-1 Practice

## *Integers and Absolute Value*

**Replace each ▫ with <, >, or = to make a true sentence.**

1. $0 \square -5$
2. $10 \square -10$
3. $-8 \square 3$
4. $11 \square 11$
5. $-18 \square -18$
6. $-18 \square 18$
7. $18 \square -18$
8. $18 \square 18$
9. $-120 \square -95$
10. $35 \square -12$
11. $-35 \square 12$
12. $41 \square 17$

**Order the integers in each set from least to greatest.**

13. $\{-14, -6, -22, 0\}$
14. $\{-3, 19, 0, -5\}$
15. $\{-7, 20, -21, 7\}$
16. $\{15, -1, 4, -3\}$
17. $\{0, -1, 2, -3, 4\}$
18. $\{55, 0, -60, 12\}$
19. $\{-48, -30, -49, -8, 3, -4\}$
20. $\{27, -9, 3, 0, -2, 29\}$

**Evaluate each expression.**

21. $|-7|$
22. $|14|$
23. $|-11|$
24. $|-9| - |6|$
25. $|-18| - |-8|$
26. $|-12| + |1|$
27. $|8 - 4|$
28. $|23| - |18|$
29. $|-16| + |-22|$

**Evaluate each expression if $a = -3$, $b = 0$, and $c = 1$.**

30. $|a| - |c|$
31. $|a| + |c|$
32. $|ab| + c$
33. $5 - |ac|$
34. $c + |-5|$
35. $c + |5|$

36. **WEATHER** At 6:15 a.m. the temperature was −8°F. At 12:15 p.m. the temperature was −12°F. At 6:16 p.m. the temperature was −10°F. Order the temperatures from least to greatest.

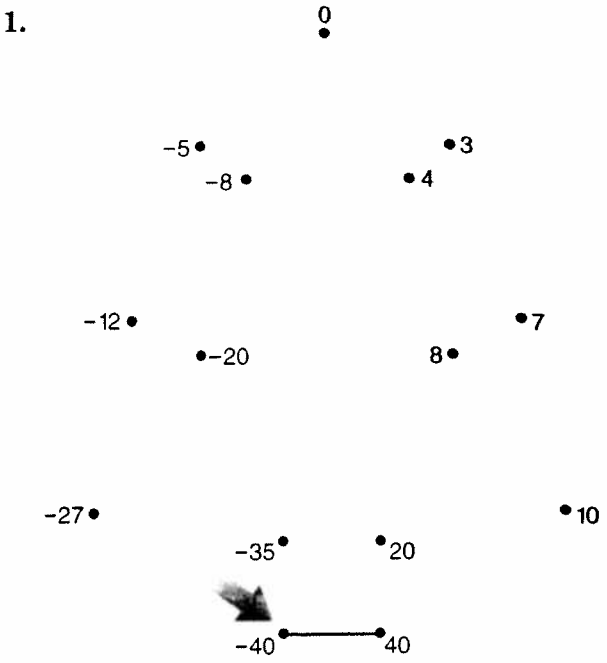
NAME _____ DATE _____ PERIOD ____

# 2-1 Enrichment

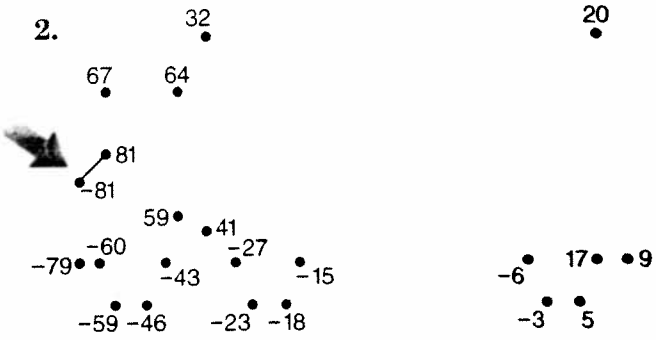
## Integers in Order

**Connect the dots in each exercise in the order of the integers shown, from least to greatest. The least integer in each exercise is indicated by the arrow.**

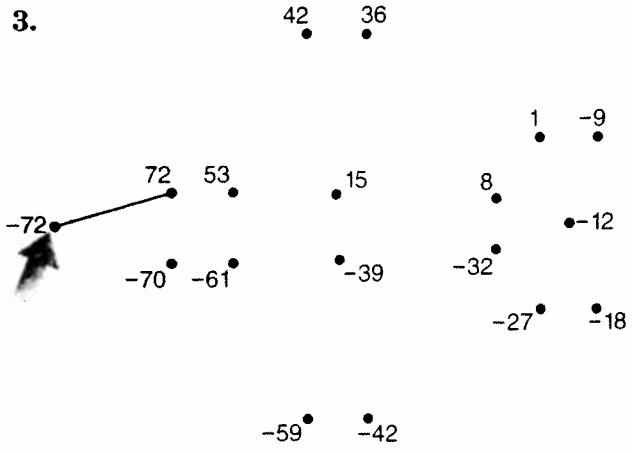
1.



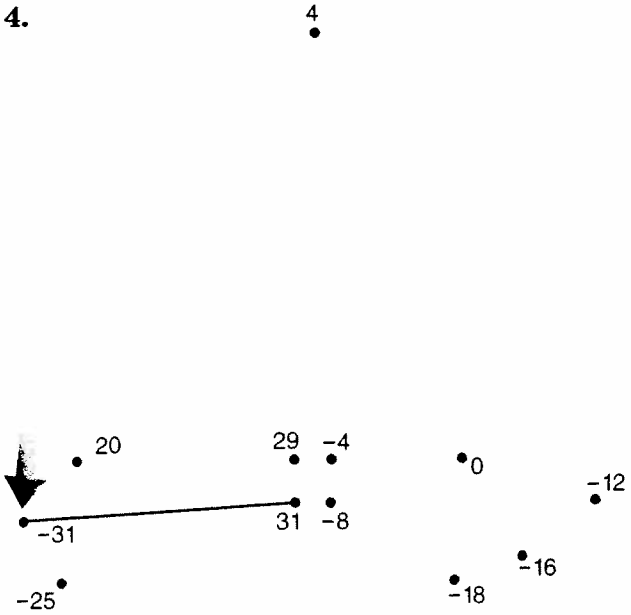

2.




3.




4.




Lesson 2-1