Important Vocabulary

Integers: A number with no fractional part.

Positive number: A real number greater than zero.

Negative number: A real number that is less than zero.

Sum: The result of adding two numbers.
Integer Operations

Important Vocabulary

Difference: The result of subtracting two numbers.

Absolute Value: The distance of a number from zero; the positive value of a number.

Product: The result of two numbers multiplied together.

Quotient: The answer to a division problem.

Adding to a Negative Integer

-2 + 6 = 4

Start here

End here
Integer Operations

Adding a Negative Integer to a Positive Integer

6 + (-2) = 4

Subtracting from Negative Integers

-4 - 3 = -7
Integer Operations

Subtracting from Negative Integers

4 - (-3) = 7

Try some on your own.

6 + (-8) = -9 + 3 = -5 + 2 =

-4 + 6 = 2 + (-7) =
Integer Operations

Rules for Multiplying Integers:
Use the eraser to reveal the results.

Multiplying two integers with the same signs:

Positive \times positive =

\begin{align*}
+ & \times + = \\
- & \times - = \\
\end{align*}

Multiplying two integers with the different signs:

Positive \times negative =

\begin{align*}
+ & \times - = \\
- & \times + = \\
\end{align*}
Integer Operations

Try some.

Find the products - move the positive and negative to remind you of the rule.

\[-5 \times (-4) = \]

\[-5 \times 4 = \]

\[6 \times (-7) = \]

Rules for Dividing Integers:
Use the eraser to reveal the results.

Dividing two integers with the same signs:

Positive ÷ positive =

\[+ \div + = \]

Negative ÷ negative =

\[- \div - = \]
Rules for Dividing Integers:
Use the eraser to reveal the results.

Dividing two integers with different signs:

Positive $\div$ negative =

$+$ $\div$ $-$ $=$

Negative $\div$ positive =

$-$ $\div$ $+$ $=$

Try some.

Find the quotients - move the positive and negative to remind you of the rule!

- $-48 \div 6 =$
  - Positive $+$

- $24 \div -6 =$
  - Negative $-$

- $-63 \div -9 =$
Integer Operations
Try some.

- $-5 \times (-4) = 20$
- $-5 \times 4 = -20$
- $6 \times (-7) = -42$
Try some.

- $-48 \div 6 = -8$
- $24 \div -6 = -4$
- $-63 \div -9 = 7$

Try some on your own.

- $6 + (-8) = -2$
- $-9 + 3 = -6$
- $-5 + 2 = -3$
- $-4 + 6 = 2$
- $2 + (-7) = -5$
Student Worksheets: Guided Notes on Integers/Exponents/Order of Operations

Integers and the Order of Operations

Part One: Integer Bases and Exponents
To evaluate an exponent, you write down the base as many times as the exponent tells you and then multiply. For example: $6^3 = 6 \times 6 \times 6 = 216$. You must be careful when the base or the exponent involves an integer value. We will only look at integer bases today.

Examples: For each problem, write out all factors and then multiply.

1. $(-3)^2 = \underline{}$
2. $-5^2 = \underline{}$
3. $x^3$ if $x = -7$
4. $-x^2$ if $x = -4$
Integer Operations

Practice: Evaluate each of the following exponents.

5. \((-8)^2\)  6. \((-1)^4\)  7. \((-3)^4\)  8. \((-2)^4\)

9. \(-2^5\)  10. \(-9^2\)  11. \(-1^{10}\)  12. \(-3^4\)

13. \((-11)^{1}\)  14. \((-3)^{3}\)  15. \((-2)^{3}\)  16. \((-1)^{7}\)

17. \(-2^3\)  18. \(-13^1\)  19. \(-4^3\)  20. \(-1^9\)

Part Two: Order of Operations

26. What is the correct order in the order of operations?
Evaluate the following problems using the order of operations. Remember your integer rules!

27. \(-4 \ast -2 \ast -3\)  
28. \((-6)(-2) + -15\)  
29. \(\frac{-20}{5} + -11\)

30. \(-8 - (7)(-2)\)  
31. \(\frac{-10}{-2} + (-3)(6) - -5\)  
32. \(-6(5 - -4) - -20\)

33. \((-2)^4(-3)\)  
34. \(10 - 4(8 - 10)^2 + 14\)  
35. \(-3^2 + -10(\frac{16}{4} - -6)^3\)

36. \((-1)^87,948,123,466\)  
37. \((-1)^{115,327,787,415}\)

38. \(-1^{87,948,123,466}\)  
39. \(-1^{115,327,787,415}\)
Integers and the Order of Operations

Name: __________________________________________

Part One: Integer Bases and Exponents
To evaluate an exponent, you write down the base as many times as the exponent tells you and then multiply. For example: \(6^2 = 6 \times 6 = 36\). You must be careful when the base or the exponent involves an integer value. We will only look at integer bases today.

Examples: For each problem, write out all factors and then multiply.

1. \((-3)^3 = \)
2. \(-5^2 = \)
3. \(x^3\) if \(x = -7\)
4. \(-x^3\) if \(x = -4\)

Practice: Evaluate each of the following exponents.

5. \((-8)^3\)
6. \((-1)^3\)
7. \((-3)^4\)
8. \((-2)^4\)
9. \(-2^6\)
10. \(-9^2\)
11. \(-1^{11}\)
12. \(-3^4\)
13. \((-11)^3\)
14. \((-3)^5\)
15. \((-2)^5\)
16. \((-1)^7\)
17. \(-2^3\)
18. \(-13^1\)
19. \(-4^3\)
20. \(-1^9\)

21. Problems 5-8 all had negative bases, inside of parenthesis, raised to an even power. What did you notice about all of the answers?

22. Problems 9-12 all had negative bases, without parenthesis, raised to an even power. What did you notice about all of the answers?

23. Problems 13-16 all had negative bases, inside of parenthesis, raised to an odd power. What did you notice about all of the answers?

24. What conjectures can you make about negative bases and exponents?

Part Two: Order of Operations

25. What is the correct order in the order of operations?

Evaluate the following problems using the order of operations. Remember your integer rules!

26. \(-4 \times -2 - 3\)
27. \((-6)(-2) + 15\)
28. \(\frac{-20}{5} - 11\)
29. \(-8 - (7)(-2)\)
30. \(-10 - (-3)(6) - 5\)
31. \(-6(5 - 4) - 20\)
32. \((-2)^4(-3)\)
33. \(10 - 4(8 - 10)^2 + 14\)
34. \(-3^2 + 10(\frac{16}{4} - 6)^2\)
35. \((87,948,123,466)^{-1}\)
36. \((87,948,123,466)^{-1}\)
37. \((87,948,123,466)^{-1}\)
38. \((87,948,123,466)^{-1}\)
39. \((87,948,123,466)^{-1}\)
Mixed Review on Integers (homework problems)

1. \(-15 + 12\)
2. \(-17 + 11\)
3. \(-15 - 10\)
4. \(-45 \div 15\)
5. \(-16 + -23\)
6. \(-17 + 56\)
7. \(40 + 12\)
8. \(-47 - 84\)
9. \(-41 - 18\)
10. \(63 \div 9\)
11. \(12(-13)\)
12. \((-1)^{46}\)
13. \((-1)^{91}\)
14. \(5 \times 7 \div 4 \div 3\)
15. \((4 + 5)7 - -24\)
16. \(29 - -3(9 - 4)\)
17. \(\frac{-38 - 12}{2 \div 13}\)
18. \((-5)^3 + 3(-4)^3\)
19. \(-\frac{12}{3} \times 5 - 4^2\)
20. \((5 - 2)^2 + (5 - 6)^3\)
### Mixed Review on Integers (II)

Name: ______________________

1. \(-3 \times 16\)  
2. \(8 - 13\)  
3. \(14 + (-9)\)  
4. \(-18 + (-11)\)

5. \(-79 + 97\)  
6. \(-17 - (-25)\)  
7. \(54 - (-18)\)  
8. \(27 - 14 - (-19)\)

9. \(8 - 17 + (-3)\)  
10. \(-\frac{48}{8}\)  
11. \(-\frac{12}{-4} \times -2\)  
12. \((-1)^{605}\)

13. \((-1)^{200}\)  
14. \(-\frac{16}{2} \times 5 \times -3\)  
15. \(-\frac{9 \times 4 + (-3) \times (-4)}{-2 \times -6}\)

16. \((-4)^3 + (-2)^2\)  
17. \((-8 - 3 \times \frac{-15}{3})\)  
18. \(-\frac{(-4 + 7)^3}{9} + 2 \times -5\)

19. \(-\frac{5 + (-3)}{2} + (-13)\)  
20. \(-5 + -2 \times 1 \times -4\)