

Important Concepts . . .

Preview Review



Mathematics Grade 8 TEACHER KEY
W1 - Lesson 4: Multiplying and Dividing
Integers

Important Concepts of Grade 8 Mathematics

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Materials Required

Protractor
Ruler
Calculator

No Textbook Required

This is a stand-alone course.

Mathematics Grade 8

Version 6

Preview/Review W1 - Lesson 4

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Preview/Review Concepts for Grade Eight Mathematics

Teacher Key



W1 - Lesson 4:

*Multiplying and Dividing
Integers*

OBJECTIVES

By the end of this lesson, you will be able to:

- Apply rules for multiplying and dividing integers
- Solve an expression involving integers and apply the order of operations
- Solve problems involving the multiplication and division of integers

GLOSSARY

BEDMAS – an acronym that is used to apply the order of operations.

Dividend – the number that is being divided by another number.

Divisor – the number by which a dividend is divided.

Factors – the numbers that are multiplied to give a product. A factor of a given number will divide into the given number with no remainder left over. For example, the 4 and 5 are factors of 20.

Product – the answer that results when numbers are multiplied.

Quotient – the answer that results when numbers are divided.

W1 - Lesson 4: Multiplying and Dividing Integers

Materials required:

- Paper, Pencil, and Calculator

Part 1: Multiplying Integers

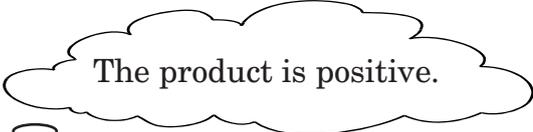
Multiplying integers involves a similar process as multiplying whole numbers. The only difference is that you have to watch the signs of the factors to decide whether the answer will be positive or negative.

Apply the following sign rules when multiplying integers:

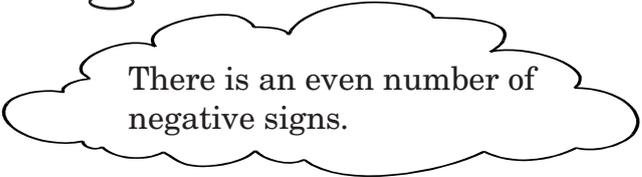
- If there is an **even** number of negative signs, then the answer will be **positive**
- If there is an **odd** number of negative signs, then the answer will be **negative**

Example 1

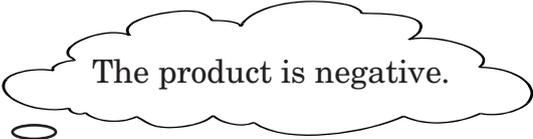
$$(-4) \times (-3) = +12$$



The product is positive.

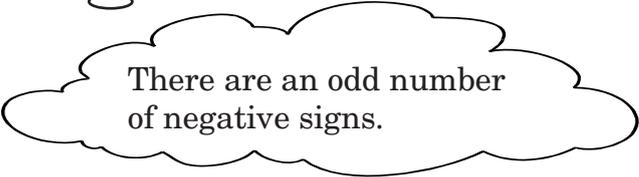


There is an even number of negative signs.

Example 2

The product is negative.

$$(+8) \times (-6) = -48$$



There are an odd number of negative signs.

Practice Questions

1. $(+9) \times (-12) =$

$$(+9) \times (-12) = -108$$

2. $(-6) \times (-5) =$

$$(-6) \times (-5) = +30$$

3. $(-3) \times (+11) =$

$$(-3) \times (+11) = -33$$

4. $(+12) \times (+7) =$

$$(+12) \times (+7) = +84$$

Part 2: Dividing Integers

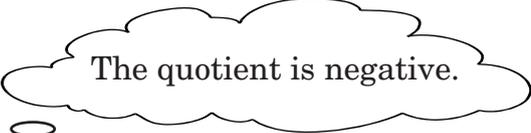
Dividing integers involves a similar process as dividing whole numbers. The only difference is that you have to watch the signs of the numbers being divided to decide whether the answer will be positive or negative.

Apply the following sign rules when dividing integers:

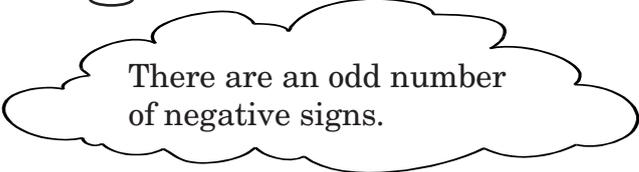
- If there is an **even** number of negative signs, then the answer will be **positive**
- If there is an **odd** number of negative signs, then the answer will be **negative**

Example 1

$$(+16) \div (-8) = -2$$



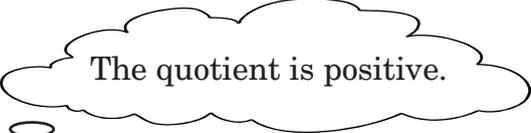
The quotient is negative.



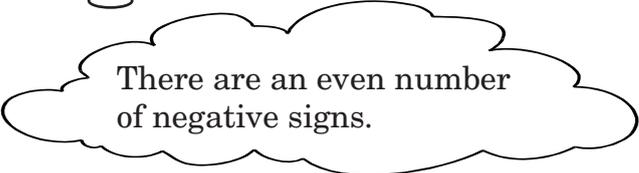
There are an odd number of negative signs.

Example 2

$$(-45) \div (-9) = +5$$



The quotient is positive.



There are an even number of negative signs.

Practice Questions

1. $(-64) \div (+8) =$

$(-64) \div (+8) = -8$

2. $(-42) \div (-6) =$

$(-42) \div (-6) = +7$

3. $(+24) \div (-6) =$

$(+24) \div (-6) = -4$

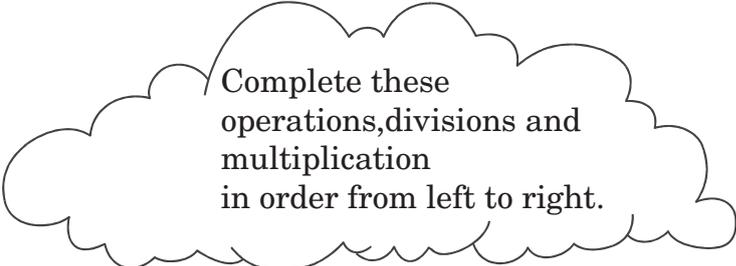
4. $(-75) \div (+25) =$

$(-75) \div (+25) = -3$

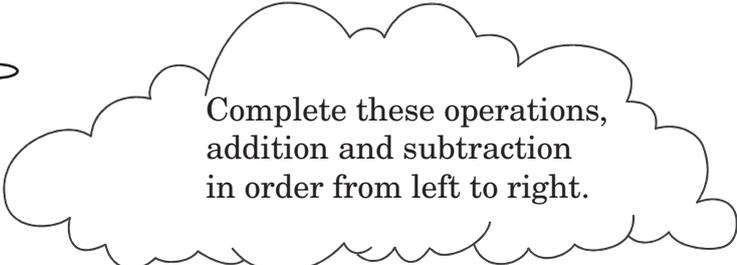
Part 3: Applying Order of Operations

When calculating the answer to an expression with many mathematical operations you must follow the order of operations. Use the acronym BEDMAS to help you.

B - brackets
E - exponents
D - division
M - multiplication
A - addition
S - subtraction



Complete these operations, divisions and multiplication in order from left to right.



Complete these operations, addition and subtraction in order from left to right.

Example 1

Evaluate the following expression $(-23 + 12) \div 11$.

Step 1: Complete the operations found in the brackets.

$$= \underline{(-23 + 12)} \div 11$$

$$= -11 \div 11$$

Step 2: Complete the division.

$$= -11 \div 11$$

$$= -1$$

Example 2

Evaluate the following expression $(-12) - (5-32) + 3^2$.

Step 1: Complete the operations found in the brackets.

$$\begin{aligned} &= (-12) - (5 - 32) + 3^2 \\ &= (-12) - (27) + 3^2 \end{aligned}$$

Step 2: Solve the exponents.

$$\begin{aligned} &= (-12) - (27) + 3^2 \\ &= (-12) - (27) + 9 \end{aligned}$$

Step 3: Complete the subtraction.

$$\begin{aligned} &= (-12) - (27) + 9 \\ &= 15 + 9 \end{aligned}$$

Step 4: Complete the addition.

$$\begin{aligned} &= 15 + 9 \\ &= 24 \end{aligned}$$

Practice Questions

$$\begin{aligned} 1. \quad & (-2)^3 + 5(-4 - 3) \\ & = (-2)^3 + 5(-4 - 3) \\ & = (-2)^3 + 5(-7) \\ & = 8 + 5(-7) \\ & = \underline{-8 - 35} \\ & = \underline{-43} \end{aligned}$$

$$\begin{aligned} 2. \quad & -2(9 - (-3))^2 \div (-12) \\ & = -2(9 - (-3))^2 \div (-12) \\ & = -2(12)^2 \div (-12) \\ & = -2(144) \div (-12) \\ & = \underline{-288 \div (-12)} \\ & = \underline{24} \end{aligned}$$

$$\begin{aligned} 3. \quad & 5 - 10 + 7^2 \times 3 \\ & = 5 - 10 + 7^2 \times 3 \\ & = 5 - 10 + 49 \times 3 \\ & = \underline{5 - 10 + 147} \\ & = -5 + 147 \\ & = \underline{142} \end{aligned}$$

$$\begin{aligned} 4. \quad & -34 - 5(-45 \div 15)^3 \\ & = -34 - 5(-45 \div 15)^3 \\ & = -34 - 5(-3)^3 \\ & = -34 - 5(-27) \\ & = \underline{-39 + 135} \\ & = \underline{96} \end{aligned}$$

Lesson 4: Assignment

1. $(+36) \times (-3) =$

$$(36) \times (-3) = -108$$

2. $(-52) \times (-4) =$

$$(-52) \times (-4) = +208$$

3. $(-17) \times (+5) =$

$$(-17) \times (+5) = -85$$

4. $(+22) \times (+10) =$

$$(22) \times (+10) = +220$$

5. $(-66) \div (-11) =$

$$(-66) \div (-11) = +6$$

6. $(+84) \div (-4) =$

$$(84) \div (-4) = -21$$

7. $(-72) \div (+9) =$

$$(-72) \div (+9) = -8$$

$$8. \quad (+65) \div (+13) =$$

$$(+65) \div (+13) = +5$$

Solve the following problems.

9. At 2:00 pm in the afternoon the temperature outside was $+24^{\circ}\text{C}$. Each hour the temperature decreased by 4 degrees. At what time was the temperature outside 0°C ?

Step 1: Determine how many hours it took the temperature to reach 0°C . Divide $+24^{\circ}\text{C}$ by 4.

$$(+24) \div (-4) = -6$$

It took 6 hours for the temperature to reach 0°C .

Step 2: Determine what time the temperature reached 0°C . Add 6 to 2:00 pm.

$$2 + 6 = 8$$

At 8:00 pm, the temperature reached 0°C .

10. A submarine dives a depth of 24 metres every time it makes a plunge. How far beneath the water will it be if it makes 7 plunges?

Multiply the depth of each plunge by the number of plunges the submarine makes.

$$-24 \times 7 = -168$$

The submarine will be at a depth of 168 metres.

11. Jocelyn owes her sister \$250.00. If she pays her sister \$50.00 every month, how many months will it take her to pay her sister back?

Divide \$250.00 by \$50.00.

$$-250 \div 50 = +5$$

It will take Jocelyn 5 months to pay her sister back.

12. Ethan has \$560.00 in his bank account. In one month he made 5 withdrawals of \$65.00 each. How much money does he have in his bank account now?

Step 1: Determine how much money Ethan withdrew from his bank account. Multiply the amount of money he withdrew by the number of times he withdrew it.

$$-65.00 \times 5 = -325.00$$

Ethan withdrew \$325.00 from his bank account.

Step 2: Calculate how much money Ethan has in his bank account. Subtract his withdrawals from the total amount of money he had.

$$560.00 - 325.00 = 235.00$$

Ethan has \$235.00 left in his bank account.

13. $(-12) - 5^2 \times (-6) =$
- $$= (-12) - 5^2 \times (-6)$$
- $$= (-12) - 25 \times (-6)$$
- $$= \underline{(-12) + 150}$$
- $$= 138$$

$$\begin{aligned} 14. \quad & (-8) - (11) \times (-27 \div 3) \\ & = (-8) - (-11) \times (-27 \div 3) \\ & = (-8) - (-11) \times (-9) \\ & = (-8) - (99) \\ & = -107 \end{aligned}$$

$$\begin{aligned} 15. \quad & ((-16) - 7 \times (-4)) \div 2 \\ & = ((-16) - 7 \times (-4)) \div 2 \\ & = ((-16) + 28) \div 2 \\ & = 12 \div 2 \\ & = 6 \end{aligned}$$

$$\begin{aligned} 16. \quad & (-36) \div 4 - (-6) \times 3 \\ & = (-36) \div 4 - (-6) \times 3 \\ & = (-9) - (-6) \times 3 \\ & = (-9) - (-18) \\ & = 9 \end{aligned}$$

