

## **Objective- TSWBAT**

- **Multiply and Divide integers by using patterns to develop rules for multiplication and division**

## Multiplication Patterns

$$5 \times 5 = 25$$

$$5 \times 4 = 20$$

$$5 \times 3 = 15$$

$$5 \times 2 = 10$$

$$5 \times 1 = 5$$

$$5 \times 0 = 0$$

$$5 \times (-1) = -5$$

$$5 \times (-2) = -10$$

$$5 \times (-3) = -15$$

Rule:

$$5 \times (-4) = -20$$

$$4 \times (-4) = -16$$

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

$$2 \times (-4) = -8$$

$$1 \times (-4) = -4$$

$$0 \times (-4) = 0$$

Rule:

## Rules:

- the product or quotient of two integers with the same sign is positive
  - $(+)(+)=(+)$  and  $(-)(-)=(+)$
- the product or quotient of two integers with different signs is negative
  - $(+)(-)=(-)$  and  $(-)(+)=(-)$
- an odd number of negative factors gives you a negative product
- an even number of negative factors gives you a positive product

## Examples

$$\textcircled{1} -25 \div 5 \quad \textcircled{-5}$$

$$\textcircled{2} -9 \cdot 4 \quad \textcircled{-36}$$

$$\textcircled{3} -34 \div (-17) \quad \textcircled{2}$$

$$\textcircled{4} 1 - (12 \times 3) \div (-9) \quad \textcircled{5}$$

$$\textcircled{5} (|-1 - 24(9)| \div |3(-8)|) \quad \textcircled{-9}$$

$$\textcircled{6} -3(2) - |-12 - 4| + (-3) \quad \textcircled{-25}$$

$$\textcircled{7} -1[3 + (-2) - (-4)] \quad \textcircled{-5}$$

Without computing, tell whether the product is positive, negative, or zero

①  $-3(8X-24)$  neg

②  $8(-83)(7)$  neg

③  $3(-21)(-12)$  pos

④  $(-1)(-1)(-1)(-1)$  pos

⑤  $(-1)(-1)(-1)(-1)(-1)$  neg

⑥  $(-1)(-1)(0)(-1)$  zero

⑦  $-[(-1)(-1)(-1)]$  pos

## Examples

①  $(-3)^4$  81

②  $-2^5$  -32

③  $-7^2$  -49

④  $2^4 - 3^2 + 5^2$  32

⑤  $4^3 - (2-5)^3$  55

⑥  $(-3)^2 - 4^2$  -7

⑦  $26 \div (4 - (-9))$  2

⑧  $-6^3 \div (-3)^2$  -24

⑨  $-8^2 - (-9)^2$  -145

Evaluate each expression for  
 $x = -6, y = 3, z = -5$

$$\textcircled{1} \frac{xy}{z-1} = \frac{(-6)(3)}{-5-1} = \frac{-18}{-6} = \textcircled{3}$$

$$\textcircled{2} 4y \div (-3z) = 4(3) \div (-3(-5)) = 12 \div 15 = \textcircled{\frac{4}{5}}$$

$$\textcircled{3} 5z - 4xy = 5(-5) - 4(-6)(3) = 25 - (-72) = \textcircled{97}$$

$$\textcircled{4} \frac{2(x-y)}{5} = \frac{2(-6-3)}{5} = -\frac{18}{5}$$

$$\textcircled{5} \frac{-5(x+y)}{3} = \frac{-5(-6+3)}{3} = \frac{15}{3} = \textcircled{5}$$

Evaluate each expression for

$$x = -4, y = -3, z = 2$$

$$\textcircled{6} \quad x^2 z \quad (-4)^2(2) = \textcircled{32}$$

$$\textcircled{7} \quad \frac{-6y^2}{z} \quad \frac{-6(-3)^2}{(2)} = \frac{-54}{2} = \textcircled{-27}$$

$$\textcircled{8} \quad 4x^2 - z \quad 4(-4)^2 - 2 = \textcircled{62}$$

$$\textcircled{9} \quad \frac{6x}{-y} + z^3 \quad \begin{array}{l} x = -4, y = -3, z = 2 \\ \frac{6(-4)}{-(-3)} + (2)^3 = -8 + 8 = \textcircled{0} \end{array}$$

$$\textcircled{10} \quad 3x - y^2 \quad 3(-4) - (-3)^2 = -12 - 9 = \boxed{-21}$$

$$\textcircled{11} \quad (xyz)^2 \quad [(-4)(-3)(2)]^2 = 24^2 = \boxed{576}$$

Homework: pgs. 27 and 28, 1-16, 19-30