

1.2

Multiplication and Division of Mixed Numbers

GOAL

Multiply and divide mixed numbers.

LEARN ABOUT the Math

Mario is using small boxes to transfer cans of soup from $2\frac{2}{3}$ large boxes in the kitchen of the food shelter to the basement.

A large box holds $1\frac{1}{2}$ times as many cans as a small box.

Once the transfer is complete, there are a total of $7\frac{3}{4}$ small boxes full of cans in the basement.



- ❓ How many small boxes of cans were moved to the basement?
How many large boxes would hold all the cans that are now in the basement?

EXAMPLE 1 | Selecting a strategy to multiply mixed numbers

Determine how many small boxes the cans in the kitchen of the food shelter will fill.

EXAMPLE 2 | Selecting a strategy to divide mixed numbers

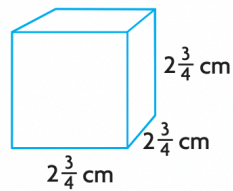
Determine how many large boxes all the cans in the basement will fill.

EXAMPLE 3 | Selecting a strategy to determine a product

Calculate $2\frac{3}{4} \times 5\frac{1}{3}$.

EXAMPLE 4 | Connecting products to powers of mixed numbers

Determine the volume of this cube.



EXAMPLE 5 | Problem solving using mixed numbers

Devon's father is installing new wood flooring. He bought boards that are 10 ft long, $\frac{3}{4}$ in. thick, and $\frac{11}{24}$ ft. wide. Determine the number of boards Devon's father will need for a 10 ft by $16\frac{1}{2}$ ft room.



1.3

Integer Operations with Powers

GOAL

Evaluate integer expressions involving order of operations and powers.

LEARN ABOUT the Math

Many contests make you answer a skill-testing question before you can claim your prize. Suppose you won a contest and you had to answer this question:

$$-2^4 + (-1 - 1)^3 + 5(-2)^4$$

? What is the answer to the skill-testing question?

EXAMPLE 1

Using the order of operations to evaluate an expression

Determine the correct answer to $-2^4 + (-1 - 1)^3 + 5(-2)^4$.



APPLY the Math

EXAMPLE 2

Selecting a strategy to calculate an expression with powers

Calculate $-3^4 + [-2 - (-4)^3] + \sqrt{16}$.

EXAMPLE 3**Evaluating an expression in fraction form**

Evaluate the expression $\frac{3x^3 + 16}{-y^3}$ when $x = -4$ and $y = 2$.

In Summary**Key Idea**

- You can use the same order of operations (BEDMAS) for integer expressions as you used for whole number expressions.

Need to Know

- For exponent $n = 1, 2, 3, 4$, and so on:
 - $(-a)^n = \underbrace{(-a)(-a)(-a) \dots (-a)}_{[n \text{ factors}]}$
For example: $(-2)^3 = (-2)(-2)(-2)$
 - $-a^n = -(a^n)$
For example: $-2^4 = -(2^4)$
 - If $a < 0$, then $(a)^n$ is positive if n is even and negative if n is odd.
For example: $(-2)^4 = 16$ and $(-2)^3 = -8$
- You can evaluate an expression for given values for the variable(s) by replacing each variable with its numeric value in brackets. Then, follow the order of operations.