

The Integer Ocean Adventure!

Your Quest to Master Positive & Negative Numbers



Ahoy, Math Explorer!

I'm Ollie, your guide to the amazing world of integers. These aren't just numbers; they're secret codes to describe everything from the coldest temperatures to the deepest parts of the ocean!



Your Mission, Should You Choose to Accept It...

In this adventure, you will become a Deep Sea Math Explorer. Your mission is to navigate the Integer Ocean, discover its secrets, and become a master of positive and negative numbers. Why? Because integers are everywhere in the real world!



Describing temperature above and below zero.



Tracking money with credits and debits.



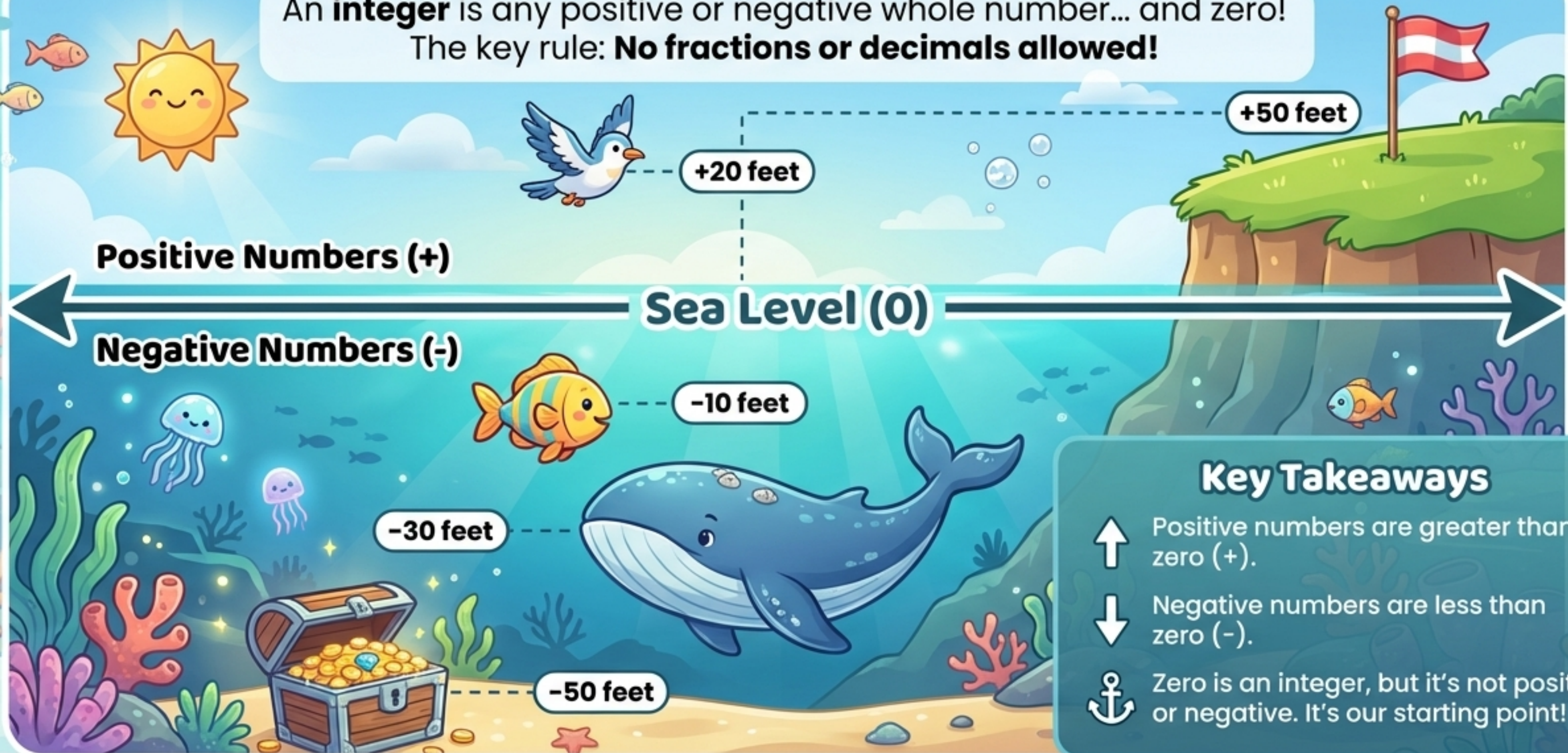
Measuring elevation above and below sea level.

Ready to dive in? Let's go!

Level 1: Discovering the Ocean Depths

What is an Integer?

An **integer** is any positive or negative whole number... and zero!
The key rule: **No fractions or decimals allowed!**



Explorer's Log: Is it an Integer?

Ollie found some strange numbered pearls. Help him figure out which ones are **integers**! For each one, say '**Yes**' or '**No**' and explain why.

5

Yes, it's a positive whole number

-95

Yes, it's a negative whole number

-15

Yes, it's a negative whole number

-4.75

No, it's a decimal!

2.5

No, it's a decimal!

$\frac{1}{2}$

No, it's a fraction!

Remember, explorers, if it's not a whole number, it's not an integer!



Level 2: Charting Your Course with the Dive Line

In the ocean, we measure depth with a dive line. In math, we use a **number line**! It helps us see where numbers are and which ones are bigger or smaller.



Key Concepts

- ↑ Numbers get **bigger** as you go UP.
- ↓ Numbers get **smaller** as you go DOWN.

A number to the right on a horizontal line (or higher on a vertical line) is always **greater**.

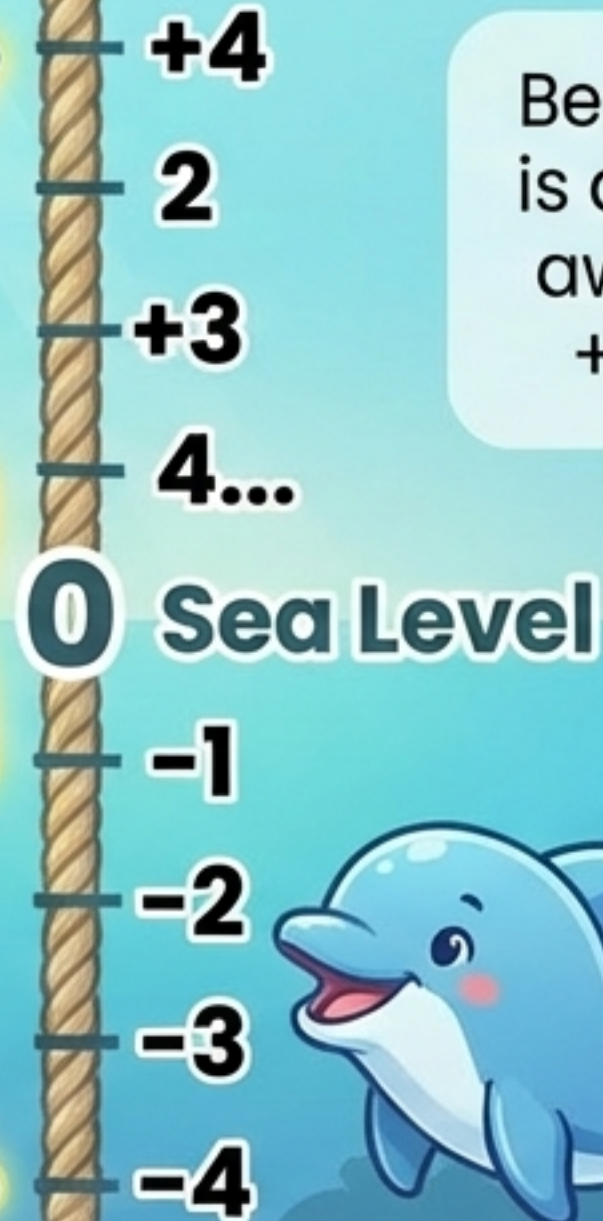
Level 3: Discovering Mirror Images (Opposites)

Two numbers are **opposites** if they are the same distance from zero, but on different sides. Think of them as mirror images across sea level!

+4 feet
above
sea level

4 Jumps
from 0

4 Jumps
from 0



Ben is at +4 and the dolphin is at -4. They are both 4 feet away from sea level (0), so +4 and -4 are opposites!

-4 feet below
sea level

Fun
Fact

Fun Fact:

What's the opposite of 0? It's just 0! Zero is its own opposite.

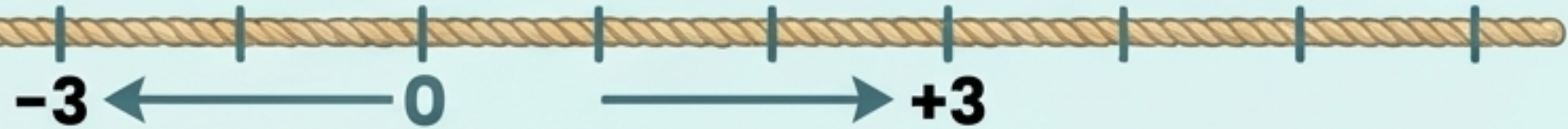
Side Quest: Find the Opposite!

Grab a pencil and paper, Explorer! Let's practice finding opposites.



I Do (Ollie Shows You)

The opposite of -3 is... $+3$! They are both 3 jumps from 0.



We Do (Let's Try Together)

What is the opposite of a **deposit of \$2000**?



First, is a deposit positive or negative? ($+2000$)



The opposite is a **withdrawal of \$2000** or **$-2000$** !



You Do (Your Turn!)

Find the opposite of each number. Be careful with the last one!

6 →

$-(15)$ →

$-(-20)$ →

$-(-20)$ means
"the opposite
of negative 20".
What could
that be?



Level 4: The Treasure Hunt (Adding Integers)

Part 1: Swimming with the Current

Adding integers is like swimming in the ocean. Sometimes you go with the current, and sometimes against it.

Concept 1: Adding Two Positives

$$3 + 2 = ?$$



Start at 3. Adding a positive 2 means moving **UP** 2 spots. You reach 5!

Concept 2: Adding Two Negatives

$$(-2) + (-4) = ?$$



Start at -2. Adding a negative 4 means moving **DOWN** 4 spots. You dive deeper to -6!

The 'Same Sign' Rule

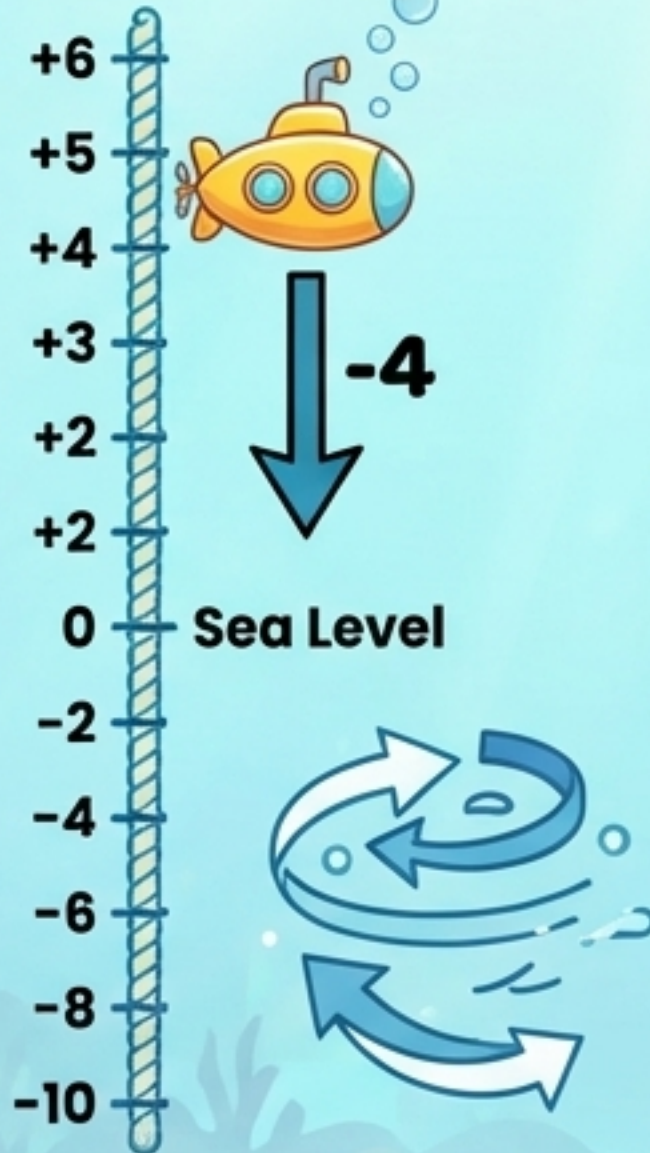
When adding integers with the same sign, add their values and keep the sign!



Treasure Hunt Part 2: Navigating Cross-Currents

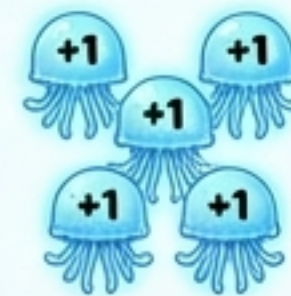
What happens when you add a positive and a negative number? It's like a tug-of-war!

$$6 + (-4) = ?$$



Start at 6. Adding a negative 4 means moving DOWN 4 spots. You end up at 2.

Here's another way to think about it! A positive and a negative of the same number cancel each other out. We call this a **zero pair**.



Step 1

Step 2

Step 2

Step 3



What's left?
3 blue jellyfish!
So, $5 + (-2) = 3$.

The "Different Signs" Rule

Subtract the smaller value from the larger value. Keep the sign of the number that had the bigger value!

Captain's Challenge: Addition Practice!

Time to test your navigation skills! Solve these sums.
You can use a number line or sketch out zero pairs to help!

1. $(-6) + 12 =$

2. $(-10) + (-7) =$

3. $(-45) + 9 =$

4. $(-7) + 7 + (-8) =$

5. Your bank account has a balance of $-\$21$.
You deposit $\$50$. What is your new balance?



Level 5: The Subtraction Plunge

Ready for a cool trick? Subtracting an integer is the SAME as adding its opposite!

Just remember this phrase: **CHANGE, CHANGE!**

Example 1: $8 - 11$

$$\begin{array}{ccc} 8 - 11 & \xrightarrow{\text{CHANGE}} & 8 + 11 \\ & \searrow \text{CHANGE} & \\ & & 8 + (-11) \end{array}$$

Now it's just an addition problem!
 $8 + (-11) = -3$

Example 2: $-5 - (-9)$

$$\begin{array}{ccc} -5 - (-9) & \xrightarrow{\text{CHANGE}} & -5 + (-9) \\ & \searrow \text{CHANGE} & \\ & & -5 + 9 \end{array}$$

Easy! $-5 + 9 = 4$

Side Quest: Subtraction Practice

Let's master the 'CHANGE, CHANGE' spell together!

We Do (Let's Try Together)

$$-17 - 18 - (-35)$$

1. First, let's tackle $-17 - 18$.

CHANGE, CHANGE!

It becomes $-17 + (-18)$,
which is -35 .

2. Now we have $-35 - (-35)$.

CHANGE, CHANGE again!

It becomes $-35 + 35$.

3. What does that equal?

Zero!

You Do (Your Turn, Explorer!)

Use 'CHANGE, CHANGE' to solve these mysteries of the deep.

1. $6 - (-7) =$

2. $-10 - 9 =$

3. $18 - 41 =$

4. You are scuba diving at -8 feet. You dive 5 feet deeper. **What is your position?**

(Hint: Does 'deeper' mean adding or subtracting a positive number?)

The Whirlpool of Multiplication & Division

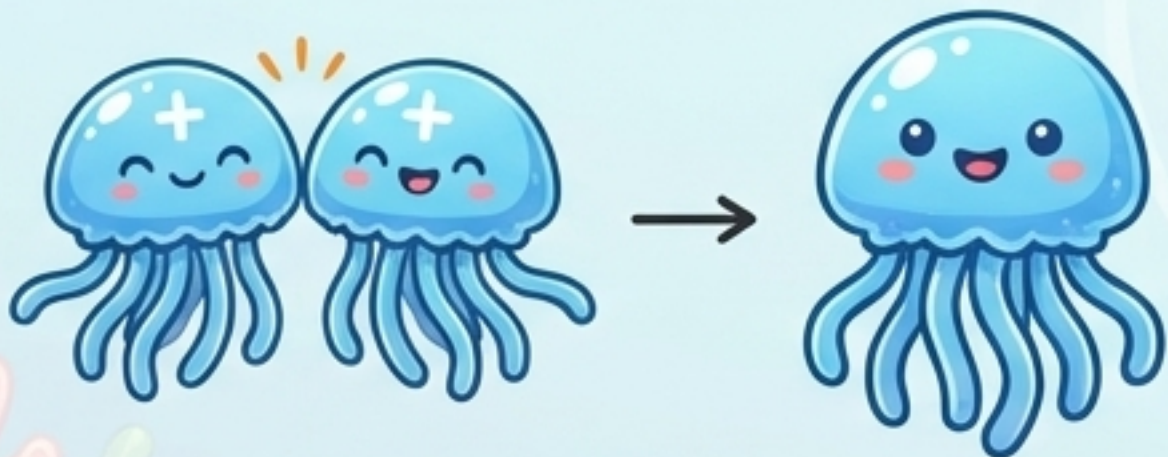
Multiplying and dividing integers is super fast once you know the two simple rules for signs!

SAME SIGNS

$$+ \cdot + = +$$

$$- \cdot - = +$$

If the signs are **SAME**,
the answer is **POSITIVE**!



DIFFERENT SIGNS

$$+ \cdot - = -$$

$$- \cdot + = -$$

If the signs are **DIFFERENT**,
the answer is **NEGATIVE**!



You Do (Your Turn, Explorer!)

$$8 \cdot 9 =$$

$$(-5)(-6) =$$

$$7(-7) =$$

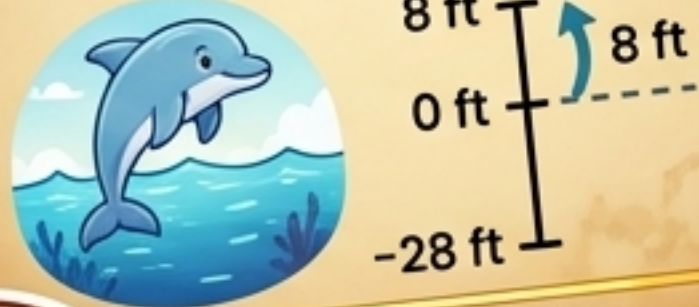
$$-35 \div 7 =$$

Final Challenge: Treasure Chest Word Problems!

You've reached the final challenge! Use everything you've learned to solve these problems and unlock the treasure.

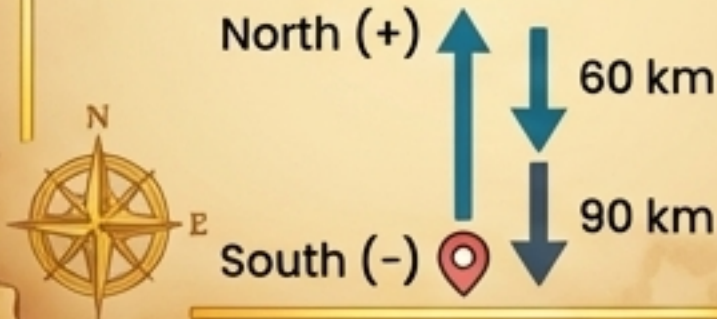
Problem 1: The Leaping Dolphin

A dolphin is swimming at -28 feet. It swims up and jumps out of the water to a height of 8 feet. Write a subtraction expression for the vertical distance the dolphin travels.



Problem 2: The Wandering Car

A car travels 60 km north of its starting point, then 90 km south. How far from its starting point is the car now? (Hint: Think of North as positive and South as negative).



Problem 3: The Ultimate Calculation

Solve:

$$-12 - (-5) - (-125) + 270 = ?$$

Solve and Unlock!

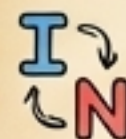
Mission Complete!

YOU DID IT, SUPER EXPLORER!

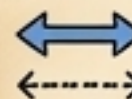
You've navigated the Integer Ocean and mastered the secrets of positive and negative numbers!



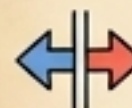
Your Explorer's Toolkit



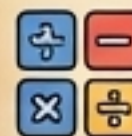
Integers: Positive and negative whole numbers and zero.



Number Line: Your map for ordering and comparing numbers.



Opposites: Mirror images across zero.



Operations: You learned the rules for adding, subtracting, multiplying, and dividing integers!

The world is full of integers. Now you have the tools to understand it all, from the highest mountains to the deepest seas!