

Name: _____ Date: _____



Riverbanks Zoo: Deep Dives & Freezing Temps



Directions: Read each real-world scenario from the Penguin Coast exhibit at Riverbanks Zoo. Write the corresponding integer or evaluate the absolute value as directed.

Section 1: Integer Identification

1. A Rockhopper penguin dives **18 feet below** the water surface in the main aquarium tank.

Integer: _____

2. A King penguin stands on an artificial ice rock **5 feet above** the water surface.

Integer: _____

3. The freezer unit at Riverbanks Zoo keeps the penguins' fish supply stored at **12 degrees below zero** °F.

Integer: _____

4. During a warm Columbia summer day, the temperature outside the Birdhouse reaches **98 degrees above zero** °F.

Integer: _____

Section 2: Comparing Integers & Absolute Value

5. A Rockhopper penguin dives down to **-14 feet**, while a King penguin swims at a depth of **-22 feet**.
- a. **a)** Write an inequality to compare the two depths:
- _____ < _____
- b. **b)** Which penguin is deeper underwater?

Answer: _____

6. Evaluate the absolute value to find the total distance from the water surface 0 feet):
- a. **a)** $-15 =$ _____ feet
- b. **b)** $+6 =$ _____ feet

Section 3: Word Problems

7. At 8:00 AM, the air temperature inside the Penguin Coast exhibit was -2°F . By noon, the zookeeper adjusted the climate controls, causing the temperature to drop **4 degrees**. What is the new indoor temperature?

Answer: _____ $^{\circ}\text{F}$

8. A zookeeper records a Gentoo penguin starting at **-3 feet** underwater. The penguin spots a fish, dives down an additional **11 feet**, and then swims back up **6 feet**.
- a. **a)** What is the penguin's final depth as an integer?

Work Area:

Answer: _____ feet

- b)** What total distance did the penguin travel during this dive? (Hint: Use absolute values!)

Work Area:

Answer: _____ feet

9. The Antarctic Storm Simulator

Inside the Penguin Coast habitat, the climate control system simulates an Antarctic windstorm. The temperature starts at -3°F . Over the next two hours, the cooling system

causes the temperature to drop **7 degrees**. Later in the afternoon, the system adjusts, and the temperature rises **5 degrees**.

- **a)** What is the final habitat temperature as an integer?
- **b)** Is the final temperature warmer or colder than the starting temperature of -3°F ?

Answer: a) _____ $^{\circ}\text{F}$ b) _____

10. Echo's Deep Sea Feeding Run

Echo the Gentoo penguin starts resting on a floating ice dock at **+3 feet** above the water surface. Seeing a zookeeper with a fish bucket, Echo dives **16 feet down** into the pool, swims up **8 feet** to catch a floating capelin, and then dives down another **6 feet** to chase a shrimp.

- **a)** What is Echo's final depth relative to the water surface (0 feet)?
- **b)** What is the total distance Echo traveled throughout the entire swim? (*Hint: Use absolute values!*)

Answer: a) _____ feet b) _____ feet

11. The Freezer Truck Delivery

A specialized supply truck arrives at Riverbanks Zoo carrying frozen krill stored at **-15°F** . While the zookeepers unload the crates onto the loading dock, the crates warm up by **18 degrees**. The zookeepers then quickly move the krill into the Penguin Coast deep-freeze unit, where the temperature drops **10 degrees**.

- **a)** Write an integer expression that models this temperature journey.
- **b)** What is the final temperature of the krill in the deep-freeze unit?

Answer: a) _____ b) _____ $^{\circ}\text{F}$

12. Rockhopper Exhibit Jump & Dive

An energetic Rockhopper penguin climbs up the rocky artificial cliff to an elevation of **+9 feet** above the pool. It leaps off the ledge and plunges **21 feet straight down** into the water. It then surface-glides upward **5 feet** before pausing to float.

- **a)** What integer represents the penguin's depth at its deepest point underwater?
- **b)** What integer represents the penguin's final position relative to the water surface?

Answer: a) _____ feet b) _____ feet

13. Zookeeper Climate Log Comparison

On a hot Columbia summer day (95°F outside), a zookeeper logs the temperatures of three different zones at Penguin Coast:

- Main Indoor Air: -4°F
- Deep Pool Water: $+36^{\circ}\text{F}$
- Fish Storage Vault: -12°F

a) What is the difference in temperature between the Main Indoor Air (-4°F) and the Fish Storage Vault (-12°F)?

b) What is the total temperature difference between the outside summer heat ($+95^{\circ}\text{F}$) and the Fish Storage Vault (-12°F)?

Answer: **a)** _____ degrees **b)** _____ degrees