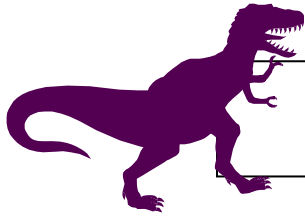
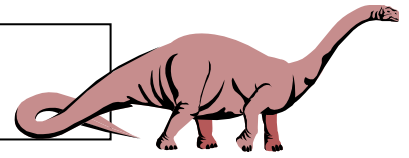


## Problem of the Month

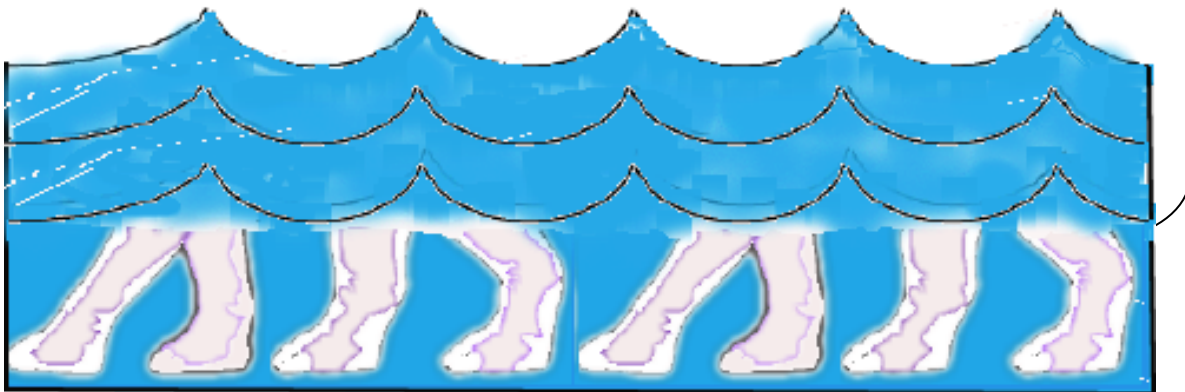


# Digging Dinosaurs



### Level A:

You are swimming under water in a lake and you see dinosaur feet in the water. You don't want to go to the surface in case they are not friendly dinosaurs. Below is a picture of what you see.



How many dinosaurs are standing in the lake?

Explain how you know. Use words and mathematical language to explain your solution.

## Level B:

You want to go with your sister to the museum to see the dinosaur exhibit. The museum has three different plans to pay for going to see the dinosaurs.

### Museum Rate Plans

**Plan A: Pay \$ 3.00 per person to visit the Museum.**

**Plan B: Monthly membership is \$8.00 for each person, but you can go as many times as you like during the month.**

**Plan C: A family membership for a month is \$17.00. Everyone in your family can go as often as they like for a month.**

You and your sister want to go see the dinosaur exhibit three times this month. Which plan should you buy to save money?

Explain your reasoning.

## Level C:

It is summer vacation and you can go to the museum more often. The rates change for a summer special.

### **Museum Summer Rate Plans**

**Plan A: Pay \$ 2.75 per person to visit the museum.**

**Plan B: Monthly membership is \$7.50 for each person, but you can go as many times as you like during the month.**

**Plan C: A family membership for a month is \$15.25. Everyone in your family can go as often as they like for a month.**

If you and your brother want to go to the museum eight times during the three months of summer, which one plan should you use and when should you go to save the most money?

What if you can't go as you originally planned? What other plans might you use? State when you would attend and the best plan(s) to use. Explain your thinking.

**Level D:**

You are going on an expedition to dig for dinosaur fossils. In digging you come across a small trunk left by another archeologist. In the trunk is a paper that lists how deep you need to dig to reach dinosaur fossils. Unfortunately, something spilled on part of the paper and it is damaged.

Years ago	Feet to Dig
10,000	14
20,000	22
30,000	30
40,000	
70,000	

Using your knowledge of mathematics, find the missing numbers in the chart. Write a generalization or rule to determine any number of feet you must dig given the number of years.

If the Jurassic period was 200 million years ago, how deep would you need to dig at this location to uncover fossils of that era? Explain why your answer is or is not reasonable.

### Level E:

Another archeologist looks closely at the paper that was excavated. She says, “Wait, that isn’t right. The first depth is not 14 feet. It is actually 4 feet. That is a wrinkle in the paper, not the digit 1.” You say, “Well that makes more sense because the functional relationship should not be linear. I think the difference in the depth diminishes as one digs deeper.”

Determine a functional relationship that approximates the sequence that begins with 4, 22, 30 and continues to increase, but by an ever decreasing rate of change.

Explain the function and generalize it.

Use your function to determine the depth you would need to dig at that location to uncover a fossil from the Jurassic era. How deep would you need to dig?

Explain if your answer seems reasonable.