Unit 2: Proportional and Nonproportional Relationships and Functions

Activity 2.1

It is usually much safer to go fishing with your friends than by yourself. A lot of dangerous things can happen while out on the ocean, so it's good to have some friends around who can help. For example, a common rule for spearfishing is to have one diver underwater while their partner stays on the surface, waiting to help if needed. Fill out the two tables below. Both tables should show that more lives are saved when there are more people present. The first table should show a function between *people present* and *lives saved*, but the second table should not be a function.

Function

People present (number)	Lives saved (number)

VS.

Not a Function

People present (number)	Lives saved (number)

Activity 2.2

There's a graduation party coming up at the end of the summer, and you want to provide fish for your friends and family who attend. So you decide to go fishing for *oama* (juvenile goatfish) the week before the party. You plan to catch the bag limit of 50 oama per day to get to your goal of 200 oama for the party.

Here's a recap of how each fishing day went:

1. The oama weren't biting for half the day, but then the pace of your catch picked up nicely and consistently.

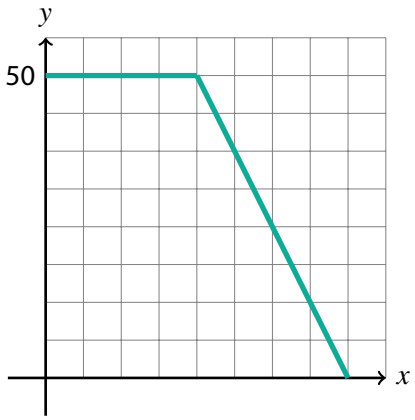
2. As soon as you got to your fishing spot, a nice fishermen gave you 50 oama because he had caught too many. Instead of taking it all home, you decided to use some for bait and fish for fun. At the end of the day, you got back to fishing for oama to replace the ones that you've used.

3. The oama was biting consistently throughout the day and you caught your limit for the day.

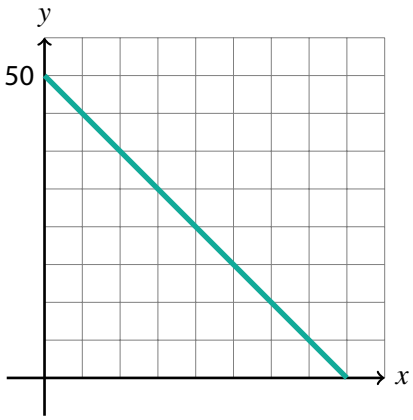
4. The oama were biting well and you caught 30 oama quickly, but then you gave some away to another fishermen. Later, you finished catching your limit.

Each of the following graphs represent the amount of oama you need catch for the day (y) vs time (x). Match each graph with a story from above (1-4).

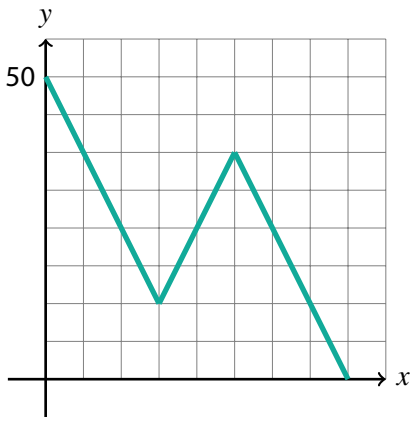
Graph A



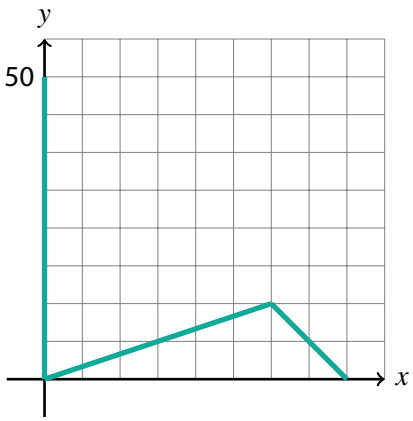
Graph B



Graph C

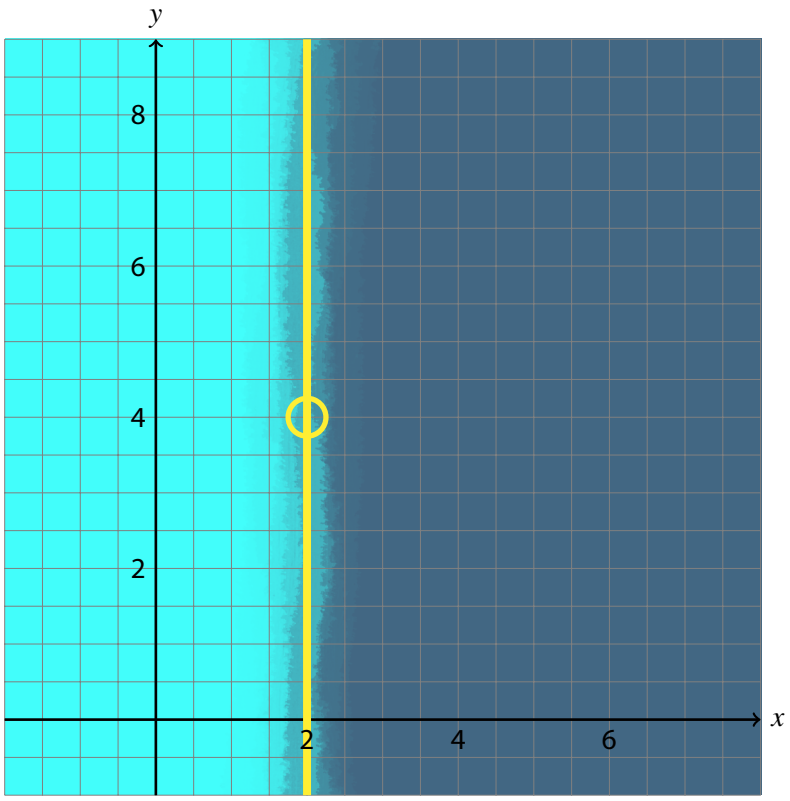


Graph D



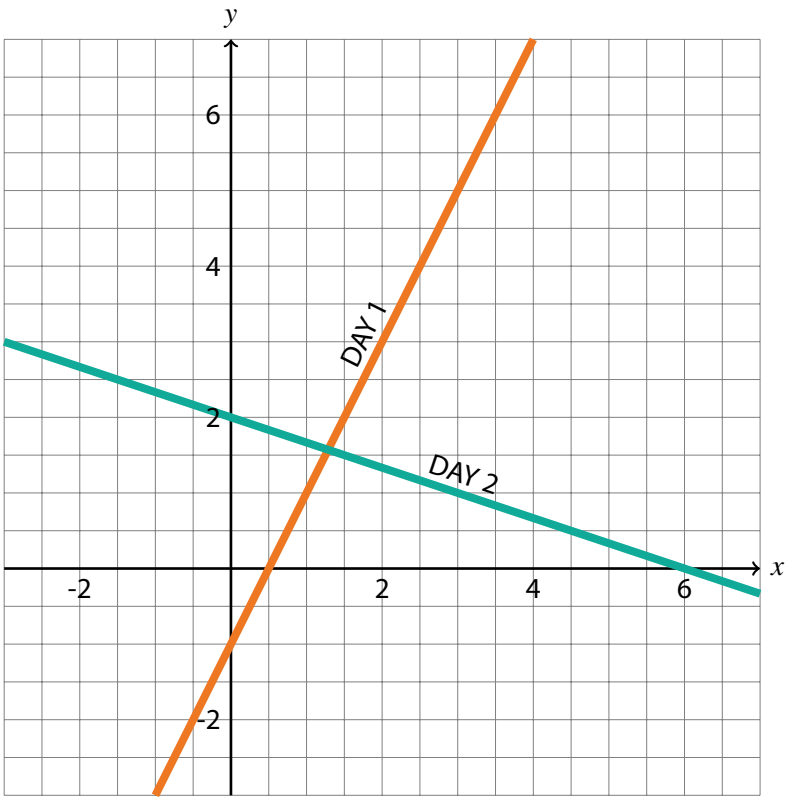
Activity 2.3

Finding fish can be hard at times, but there are places where fish tend to hang out. One of these places is along ledges and steep drop offs of the reef. Below is a bird's eye view of a reef with a line showing its drop off. The circle at (2, 4) is a good place to catch fish. What are three other coordinates that are good places to find fish?



Activity 2.4

A modern GPS (Global Positioning System) can accurately pinpoint your location and track your progress throughout a day. Below is the GPS data from your last two fishing trips.



Find the equations to best describe your path for the Day 1 (the orange line) and Day 2 (the blue line) to let your friends know where the fish was biting.

Are these equations examples of linear functions?

Activity 2.5

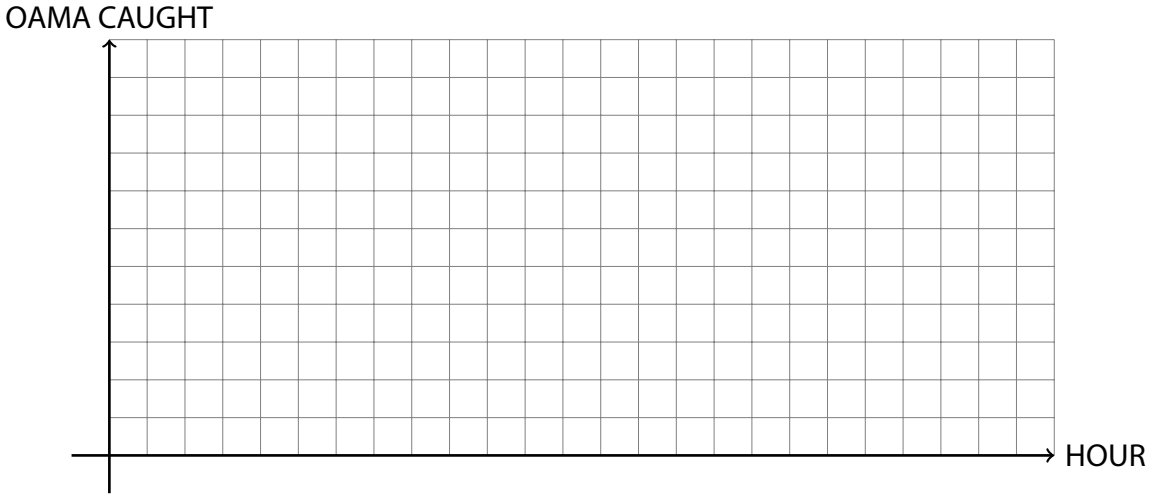
A *live well* is a container with a water pump used for keeping fish alive, typically fish that will be used as bait. Suppose that your live well is cylindrical with a height of 10 inches and a radius of 4 inches. Your water pump can bring in new salt water at a rate of 100 cubic inches per minute. At this rate, how long will it take you to completely fill your live well without it overflowing? Round your answer to the nearest minute.

Activity 2.6

Oama season has come again this summer, and here is how the day went fishing for you:

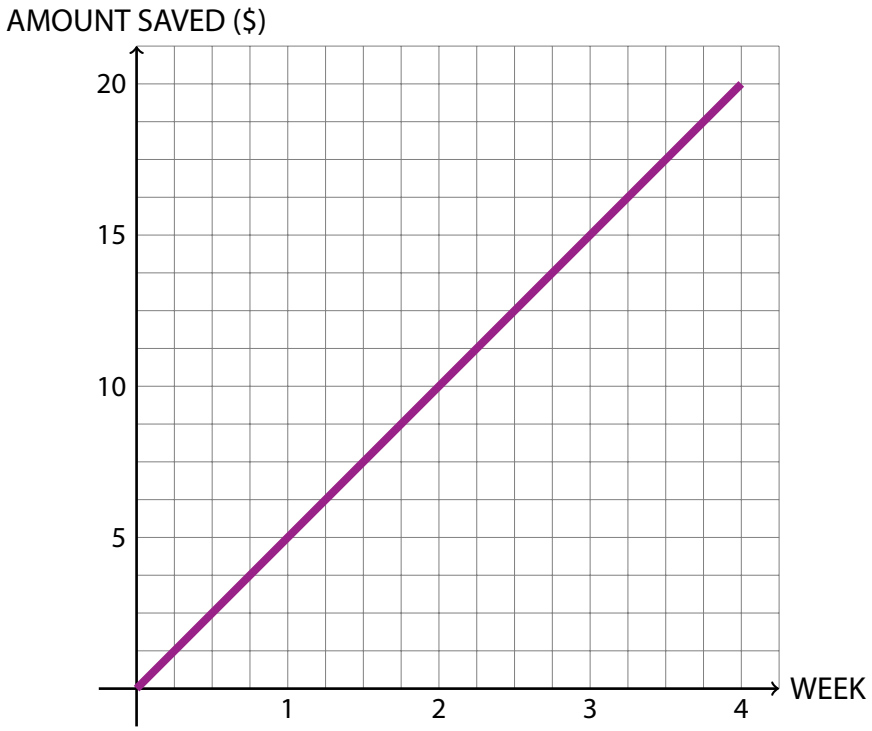
- For the first hour, the fish were biting fast, then it slowed down, You caught 10 oama.
- Over the next two hours, the fish were biting at a steady rate until you had 25 oama total in your cooler.
- Unfortunately, for the next hour, the fish weren't biting at all.
- In the hour after that, the fish started biting slowly. Luckily, the fishing picked up, and you now 40 in the cooler.
- Over your final hour fishing, you steadily caught your last 10 oama, reaching your bag limit for the day.

On the Cartesian plane below, graph how this day of fishing might look in terms of the number of fish caught over time.



Activity 2.7

You and two of your friends are saving up for some new fishing gear. Kainoa saved up his money and showed you how much he saved on a graph.



Lilo saved up some money too, but showed you her savings in a table:

Week	Total amount saved
1	$4.50
2	$9.00
3	$13.50
4	$18.00

You also saved some money, but you saved the same amount of money every week for 4 weeks. You modeled your savings with the equation: $s = 5.5w$, where s is how much you saved and w is the number of weeks.

Among the three of you, who was able to save the most amount of money each week, and who saved the least amount per week? Please explain how you got your answer.