Second example

In this activity we give a second example.

Here we have a multi-part question with free-response.

Question 1 *Suppose you are standing on a bridge that is 60 meters above sea-level. You toss a ball up into the air with an initial velocity of 30 meters per second. If t is the time (in seconds) after we toss the ball, then the height at time t is approximately $f(t) = -5t^2 + 30t + 60$. What does $f(2)$ mean in our context?*

Solution

Hint: *We want an answer in the context of the problem.*

Free Response: The value $f(2)$ is the height of the ball after 2 seconds.

Now suppose t is such that $f(t) = 100$. What does this mean in our context?

Solution

Hint: *We want an answer in the context of the problem.*

Free Response: These value of t are the times when the ball is at 100 meters above sea level.

Finally, if h is a small positive value what is the meaning of $f(t+h)$? How does this compare to the meaning of $f(t) + h$?

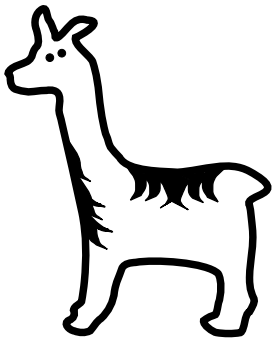
Solution

Hint: *We want an answer in the context of the problem.*

Free Response: The value $f(t + h)$ gives the height of the ball slightly after time t. On the other hand, the value $f(t) + h$ gives a height just higher than the ball at time t.

Learning outcomes: Understand a second example of the Ximera style. See how to include graphics.

Here is a picture of a llama:



If you like, check out this video.

Exploration 2 *Write a Python script that will compute factorial for you.*

Solution

Python

```
def honest_factorial(x):
  result = 1
  for i in range(1,x+1):
    result *= i
  return result

def verifier():
  for i in range(10,20):
    if factorial(i) != honest_factorial(i):
      raise "Your function failed for input " + str(i)
  return True
```

YouTube link: http://www.youtube.com/watch?v=0aQpLSu2fMs