Task 1.3.3: Reflect and Apply

Solutions

1. Create a function rule that would make your students work to find a good viewing window. Record the good viewing window.

Answers will vary.

2. For $f(x) = 200 - 10x^2 - x^3$,

   a. find a viewing window that gives a complete graph of *f*.

It is important when graphing a function that enough of the graph is shown so that any viewer of the graph can determine the rest of the graph as a continuation of what actually appears. This notion of a complete graph can be accomplished with the following viewing window:
$-10 \le x \le 10$, $-100 \le y \le 300$

   b. find a viewing window that makes it appear that *f* is a line.

Answers vary, but one possibility is $-5 \le x \le -3$, $-100 \le y \le 200$

   c. find a viewing window that makes it appear that *f* is a quadratic opening up.

Answers vary, but one possibility is $-20 \le x \le 20$, $-100 \le y \le 200$

   d. find a viewing window that makes it appear that *f* is a quadratic opening down.

Answers vary, but one possibility is $-10 \le x \le -3$, $-100 \le y \le 100$

3. Find a viewing window that contains the points: (-9, 12), (2, -8), (3, 20).
   Answers vary, but one possibility is $-10 \le x \le 4$, $-10 \le y \le 21$

Math notes

This task has within it very important notions about scale and domain and range restrictions. The parts to Exercise 2 underscore the need to develop intuition about what a function, say a cubic function, should look like, so that issues of scale would not lead us to falsely conclude (the regression button on your calculator is fooled by this also) that a function is, say quadratic, when it is not.

Teaching notes

This task is most appropriately used as a homework assignment or as an assessment.

Task 1.3.3: REFLECT AND APPLY

1. Create a function rule that would make your students work to find a good viewing window. Record the good viewing window.

2. For $f\left(x\right) = 200 - 10x^2 - x^3$,
   a. find a viewing window that gives a complete graph of *f*.

   b. find a viewing window that makes it appear that *f* is a line.

   c. find a viewing window that makes it appear that *f* is a quadratic opening up.

   d. find a viewing window that makes it appear that *f* is a quadratic opening down.

3. Find a viewing window that contains the points: (-9, 12), (2, -8), (3, 20).