

Math 41: Example Homework Solutions

The following examples, from Section 1.1 in your text, show what we expect you to write in a complete solution. The idea is to write enough information in English that a peer in the class can understand the math you are doing easily. We will expect this amount of detail in your weekly homework problems and in exam answers.

The first example doesn't require much explanation – just a sentence. Notice, though, that rather than just say “yes” we include a reason why. Always try to include a reason for your answers.

6. Yes, the curve is the graph of a function because it passes the Vertical Line Test. The domain is $[-2, 2]$ and the range is $[-1, 2]$.

The second example requires a lot of writing: we're explaining a graph in words.

9. The person's weight increased to about 160 pounds at age 20 and stayed fairly steady for 10 years. The person's weight dropped to about 120 pounds for the next 5 years, then increased rapidly to about 170 pounds. The next 30 years saw a gradual increase to 190 pounds. Possible reasons for the drop in weight at 30 years of age: diet, exercise, or health problems.

The third example is similar to a lot of problems you'll do in homework and on tests. It requires you to do a bit of calculating. When writing up a problem that involves calculating, we want to see each step you took in a logical order: The second step should follow the first step, etc. Also, make sure you explain what your letters mean as soon as you use them. Note that the first sentence of this example clarifies what L and W will be.

53. Let the length and width of the rectangle be L and W . The perimeter is $2L + 2W = 20$ and the area is $A = LW$.

Solve the first equation for W in terms of L : $W = (20 - 2L)/2 = 10 - L$.

Then $A(L) = L(10 - L) = 10L - L^2$.

Note the lengths of both sides must be positive, so the domain of A is $0 < L < 10$.

Our final example is the simplest. It's the type of solution we expect from a very routine problem. In this case, explaining the solution involves pointing to the graph in the book, so the written explanation can't really contain much. It's fine to give very short answers to this type of problem — however, be careful not to confuse this type of problem with the other three above! When in doubt, it's better to write more than less.

- 1.** (a) $f(1) = 3$
- (b) $f(-1)$ is about -0.2 .
- (c) $f(x) = 1$ when $y = 1$ on the graph. So $f(x) = 1$ when $x = 0$ and $x = 3$.
- (d) $f(x) = 0$ when x is about -0.8 .
- (e) The domain is $[-2, 4]$; the range is $[-1, 3]$.
- (f) f is increasing on $[-2, 1]$.