1. TA Hailee has a secret function $f(x)$. She tells you that the function passes through $(1, 6)$ and that the slope of the tangent line of $f$ at $(x, f(x))$ is $2x + 1$. What if $f(2)$?

The problem gives us that $f'(x) = 2x + 1$ and that the original function passes through $(6, 1)$. We’re asked to compute $f(2)$, so here’s what I did:

(a) Take the antiderivative of $f'(x)$. I got

$$f(x) = x^2 + x + C.$$ 

(b) Use the information in the problem to find $C$. In this case, we know that $f(x)$ passes through $(6, 1)$ so $f(1) = 6$. First I plug one into my function. I get

$$f(1) = (1)^2 + (1) + C$$

$$= 1 + 1 + C$$

$$= 2 + C.$$ 

So I now know that $f(1) = 6$ and $f(1) = 2 + C$. Then $6 = 2 + C$. So $C = 4$.

(c) I put together the information in the previous step to see that

$$f(x) = x^2 + x + 4.$$ 

(d) Now it is easy to compute $f(2)$. We take

$$f(2) = (2)^2 + (2) + 4 = 4 + 2 + 4 = 10.$$ 

2. Complete (don’t forget to attach!) Hailee’s worksheet on Antidifferentiation.

3. Do the following problems from your textbook.

2.6 Exercises 5,15

2.7 Exercises 1,11

6.1 Exercises 1,3,9,13,17,27,43,61