Solving with substitution

As we've seen in previous lessons, the simplest way to evaluate a limit is to substitute the value we're approaching into the function.

For instance, given the function $f(x) = x + 1$, finding the limit as $x \to 5$ is as easy as substituting $x = 5$ into $f(x)$.

$$\lim_{x \to 5} x + 1$$

$$5 + 1$$

$$6$$

Substitution should always be the technique we try first, before anything else, when we evaluate a limit, because it's the easiest and fastest method. If substitution doesn't work, we can then move to other techniques.

Example

Evaluate the limit.

$$\lim_{x \to -2} x^2 + 2x + 6$$

Since we're approaching $x = -2$, we'll substitute $x = -2$ into the function.

$$(-2)^2 + 2(-2) + 6$$

$$4 - 4 + 6$$

6

So the limit of the function as $x \to -2$ is 6.
