

Problems for Lecture 11

February 9, 2015

1. Use the ϵ, δ - definition of a limit to prove that

$$\lim_{x \rightarrow 2} x^3 = 8.$$

Note that $x^3 - 8 = (x - 2)(x^2 + 2x + 4)$.

2. Use the ϵ, δ - definition of a limit to prove that

$$\lim_{x \rightarrow 1} \frac{1}{x} = 1.$$

Hint: Use the triangle inequality to show that if $|x - 1| < \frac{1}{2}$ then

$$\frac{1}{|x|} < 2.$$

3. Use the ϵ, δ - definition of a limit to prove that

$$\lim_{x \rightarrow 4} \sqrt{x} = 2.$$