



Calculus I (Maths 201–NYA)

Limits

With Answers

*Justify your answers—just having the correct answer is not sufficient.*

1.  $\lim_{x \rightarrow -2} \frac{2 - \sqrt{x^2}}{\sqrt{x+6} - 2}$

2.  $\lim_{t \rightarrow 1} \frac{9 - (4 - t^2)^2}{te^t - e^t}$

3.  $\lim_{x \rightarrow \infty} \sqrt{x + \sqrt{x}} - \sqrt{x - \sqrt{x}}$

4.  $\lim_{x \rightarrow -\infty} \frac{e^x}{4 + 5e^{3x}}$

5.  $\lim_{x \rightarrow 0} \sqrt[3]{x^2} \cos\left(\frac{3-x}{x^2}\right)$

**Answers**

(The answers are “easy”, using standard methods as shown in class. I’ve given hints as to how to do that. Ask if you need a complete solution.)

1. 4 (Hint: Rationalize)
2.  $12/e$  (Hint: Simplify the algebra [multiply out and factor]; the  $0/0$  will “cancel out”.)
3. 1 (Hint: Rationalize, then “don’t sweat the small stuff”)
4. 0 (Hint: “Don’t sweat the small stuff”)
5. 0 (Hint: Use the Squeeze Theorem)