

# MTH 201: Calculus – Module 1B

Post-class activities

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## Reminders:

- Post-class activities are to be worked out in ClassKick.
- There is nothing to turn in — your work is saved automatically on ClassKick.
- They are graded check/x on the basis of completeness and effort, like Daily Prep activities. A check counts as 1 engagement credit.
- You can work freely with others on these, but please for your own benefit, don't just copy work.
- If you need help or want Prof. Talbert to check your work, use the "raise hand" feature on ClassKick.

# Limits with algebra

Consider the limit:

$$\lim_{x \rightarrow 2} \frac{16 - x^4}{x^2 - 4}$$

First, use a table of values or a graph to estimate the limit. If you use a graph, include a link to the Desmos graph.

## Limits with algebra continued

Now use algebra to simplify the expression first and then find the limit.

Hint: Start by factoring the top and the bottom. You can use Wolfram—Alpha to help if you want. Note that your answer here should agree with the answer you got from the graph.

## Average velocity

The position function for a falling ball is given by  $s(t) = 16 - 16t^2$ , where  $s$  is measured in feet and  $t$  in seconds. Write an expression that gives the **average** velocity of the ball from  $t = 1$  to  $t = 1 + h$  and simplify completely.

## Instantaneous velocity

Use the expression for average velocity to find the **instantaneous** velocity of the ball at the moment  $t = 1$ . Spoiler: The answer is  $-32$  feet per second.