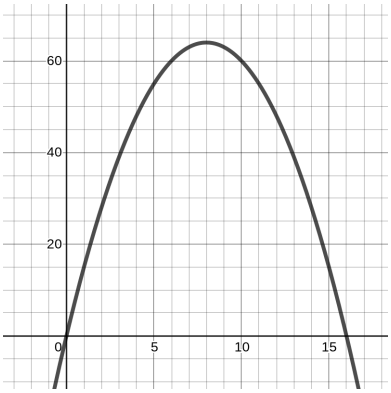
Directions:

- Do only the problems that you need to take and feel ready to take. If you have already earned Mastery on a Learning Target, do not attempt a problem for that Target! You can skip a Target if you need more time to practice with it, and take it on the next round.
- Each Learning Target problem is to be written up on a separate sheet, scanned to separate PDF files, and submitted to the appropriate Learning Target "assignment" on Blackboard. **Please do not submit more than one Learning Target in the same PDF, and make sure you are submitting it to the right Blackboard area.**
- If you are handwriting, submit your work by **scanning your work** using a scanning app or scanning device; **do not just take a picture** but scan your work to a clear, legible, black and white PDF file of size less than 100 MB. **Work submitted as an image file (JPG, PNG, etc.) will not be graded.**
- Please consult the grading criteria found in the Information on Learning Targets and Checkpoints document found in the *Learning Targets* area on Blackboard prior to submitting your work, to make sure your submission has met all the requirements.
- Please use the approved resources to double-check your work against errors prior to submitting your work.

Learning Target 1: *I can find the average rate of change of a function and the average velocity of an object on an interval.*

1. Let $f(x) = 4 - \sqrt{x}$. Find the average rate of change in f on the intervals $[1, 9]$ and $[2, 2.01]$. If you round, round your decimals to four places.
2. Let $g(x)$ be the graph shown below. Find the average rate of change in g on the intervals $[1, 5]$ and $[5, 16]$.



3. A car is moving down a straight racetrack, and its distance s (in feet) from an observation booth on the track at time t seconds is given by the following table:

Time	0	15	30	45	60
Distance	10	90	200	450	550

Find the student's average velocity from $t = 0$ to $t = 15$ and from $t = 30$ to $t = 60$.

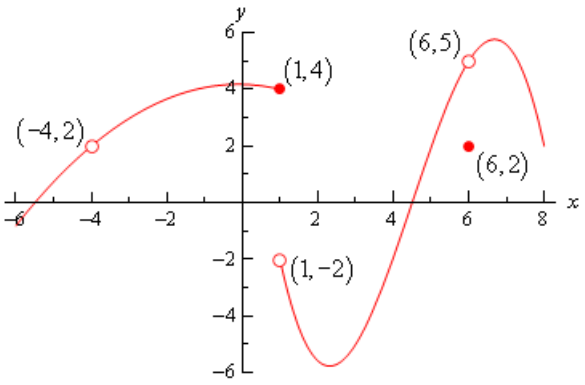
Learning Target 2 (Core): *I can find one- and two-sided limits of a function at a point and at infinity using numerical, graphical, and algebraic methods.*

1. Complete the table of values below using the function $f(x) = \dfrac{\sqrt{9+x}-3}{x}$. Then state the value of $\lim_{x\to 5} f(x)$ and explain your reasoning. You do not need to show your work on computing the table values, but they must all be correct.

x	-0.5	-0.1	-0.01	0.01	0.1	0.5
$f(x)$						

2. Using only algebra (no graphs or tables), evaluate $\lim_{y\to 7} \dfrac{y^2-4y-21}{3y^2-17y-28}$.

3. The function $h(x)$ is shown below. State the value of each limit shown below the graph. If the limit doesn't exist, write "does not exist" and then explain why.



(a) $\lim_{x\to 1} h(x)$
(b) $\lim_{x\to 1^+} h(x)$
(c) $\lim_{x\to 6} h(x)$
(d) $\lim_{x\to -4} h(x)$

Learning Target 3: *I can find the derivative of a function (both at a point and as a function) and the instantaneous velocity of an object using the definition of the derivative.*

Consider the function $f(x) = 3x^2 - 5x + 1$.

1. Write out the correct limit expression that would compute $f'(2)$.
2. Find the exact value of $f'(2)$ by computing the limit from part (a), using algebraic techniques.

Note: Your solution *must* begin with a correct statement of the limit. Your solution *can only* be found by evaluating the limit; no "shortcut" methods from later parts of this course are allowed (except in your notes to check your answer). *All significant algebra steps* must be shown and done correctly.