## **Difference Quotient**

Recall the difference quotient of the function f(x) is  $\frac{f(x+h)-f(x)}{h}$ Practice on your own:

- 1. Find the difference quotient of f(x) = 5x + 10.
- 2. Find the difference quotient of  $f(x) = \frac{x^2-4}{x+2}$  [Hint: Can you simplify the expression for f(x)?]

For the rest of this sheet, let =  $f(x) = 2x^2 + 4x + 2$ .

- 3. List at least 5 points of your function in an xy-table (if your graph does not reflect the shape of the function, choose additional points).
- 4. Graph your function.



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- 5. Draw a line between the two points (-1,0) and (0,2). Label the points A and B. The line between A and B is a called a **secant** line.
- 6. Find the slope of your secant line.

## 7. Mark the point (-0.5,0.5) as point C.

8. How could you write the coordinates of point C in terms of point A?

## 9. Draw a line between point C and point A. This is another secant line.

10. Find the slope of this secant line (show your work).

11. If C was even closer to point A, what do you think the slope of the secant line would be?

12. How could this relate to the difference quotient?