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

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

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 $(-\mathbf{0}, \mathbf{5}, \mathbf{0} .5)$ 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?

