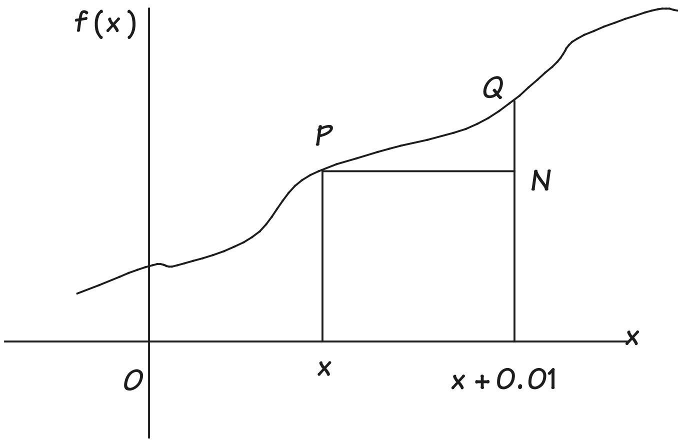
CHORD-SLOPE FUNCTION 1

In **Chord gradients** you worked out the gradient of the chord ***PQ*** as ***Q*** gets closer to ***P*** for different position of ***P*** on the graph of $f(x) = x^2$. This idea can be generalised to any function $f(x)$.



Gradient of chord $PQ = \dfrac{QN}{PN} = \dfrac{f(x + 0.01) - f(x)}{0.01}$

PN does not have to be of length **0.01**. More generally, the gradient of chord ***PQ***—or the **chord-slope function**—can be written as $\dfrac{f(x + h) - f(x)}{h}$ where in the picture h is shown as **0.01**.

- Use the chord-slope function with $h = 0.01$ to determine an approximate value of $f'(x)$ for each of the following functions, using values of x for each integer value from -4 to 4:

1	$f(x) = 2x^2$	5	$f(x) = x^2 + 2x$
2	$f(x) = 3x^2$	6	$f(x) = 3x^2 - x$
3	$f(x) = 4x^2$	7	$f(x) = 2x^2 - 3x$
4	$f(x) = -2x^2$	8	$f(x) = \frac{1}{2}x^2 + x$

- Deduce a formula for $f'(x)$ **for** $f(x) = ax^2 + bx + c$.

- You could see if your formula is correct by using the gradient function facility on a graph plotter or on a computer algebra system such as **Derive**.

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