

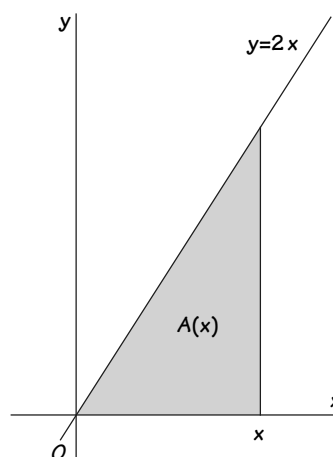
Linear functions

- Draw a sketch of the graph of $y = 2x$.

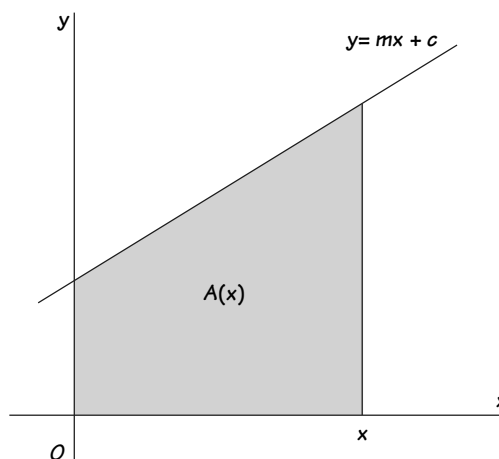
What is the shaded area when $x = 1$?

When $x = 2$? When $x = 3$?

Write down a formula for the shaded area $A(x)$.



- Do the same for $y = 5x$ and $y = 10x$.
- Write down a formula for the area $A(x)$ when $y = mx$.
- Now try to find a formula for the area $A(x)$ when $y = mx + c$.



Quadratic functions

Now we are going to look at the same function $A(x)$ for graphs of quadratic functions.

- Sketch $y = 3x^2$.

Find approximate values for $A(1)$, $A(2)$, $A(3)$... using the trapezium rule.
Can you predict a formula for the area $A(x)$?

- Do the same for $y = x^2$.
- Now try to find a formula for the area $A(x)$ for other quadratic functions such as $y = 3x^2 + 2$ or $y = 3x^2 + 4x$.