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2.16 Further graph transformations

# Checklist

## What you should know

By the end of this subtopic you should be able to:

- sketch the graphs of $y = |f(x)|$ and $y = f(|x|)$ and know the difference between them, including that the graph of $y = |f(x)|$ is always above the $x$-axis and that $y = f(|x|)$ is always an even function
- sketch the graphs of $y = \frac{1}{f(x)}$ from a given function $f(x)$
- find all the asymptotes of $y = \frac{1}{f(x)}$ from a given $f(x)$
- find the shape of $y = \frac{1}{f(x)}$ on both the sides of the asymptotes
- sketch and analyse the transformation $y = f(ax + b)$ understanding that both $a$ and $b$ give horizontal transformations only, i.e. a horizontal stretch and a horizontal translation respectively.
- sketch $y = f(ax + b)$ from a given graph of $y = f(x)$ and vice versa
- sketch and analyse the graph of $y = (f(x))^2$ and know the difference between them
- use the properties of the graph of $y = (f(x))^2$
- solve equations and inequalities involving modulus functions, giving solutions on a number line and in interval form and using a graph to solve modulus inequalities between two functions.