

| Essential Knowledge Milestones | | Teaching Points | |
|---|-------------------------|--|-----------|
| <ul style="list-style-type: none"> understand the effect of simple transformations on the graph of $y = f(x)$; be able to sketch the result of a simple transformation given the graph of any function $y = f(x)$. | | <ul style="list-style-type: none"> Transformations to be covered are: $y = af(x)$, $y = f(x) + a$, $y = f(x + a)$ and $y = f(ax)$. Students should be able to apply one of these transformations to any of the functions listed and sketch the resulting graph: <ul style="list-style-type: none"> quadratics, cubics, quartics, reciprocals, $y = \frac{a}{x^2}$, $\sin x$, $\cos x$, $\tan x$, e^x and a^x. Students will need to be able to transform points and asymptotes both when sketching a curve and to give either the new point or the equation of the line. Given a curve or an equation that has been transformed students should be able to state the transformation that has been used. Links can be made with sketching specific curves. Students should be able to sketch curves like $y = (x - 3)^2 + 2$ and $y = \frac{2}{x-3} + 2$ | |
| Assumed Prior Knowledge/ Links / Interleaving | | <ul style="list-style-type: none"> GCSE Transformations Asymptote Trig Graphs | |
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| Potential Barriers to Access | | Opportunities for Reasoning/Problem Solving/Proofs | |
| <ul style="list-style-type: none"> One of the most common errors is translating the curve in the wrong direction for $f(x + a)$ or $f(x) + a$. Students sometimes also apply the wrong scale factor when sketching $f(ax)$. Other errors involve algebraic mistakes and incomplete sketches, or sketches without key values marked. Students should be encouraged to check any answers they have calculated against their sketches to check they make sense | | <ul style="list-style-type: none"> Use a graphical package in which the graph is transformed by an unknown constant and students encouraged to think about the effects this will have. | |
| | | Questions & Prompts | |
| | | <ul style="list-style-type: none"> The graph $y = f(x)$ has a turning point at (2, 4), what are the coordinates of the turning point for $y = 3f(\frac{1}{2}(x - 2))$? (5, -10) lies on $y = f(x)$ the point is transformed to (5, -2) what is the equation of the line? The graph $y = \sin x$ is translated by $\begin{pmatrix} -45 \\ 0 \end{pmatrix}$ what is the equation of the translated graph? (6, 4) is the turning point of the graph $y = f(2x) - 3$. What is the turning point of $y = f(x)$? $f(x) = x^2 + 4$ what is $f(3x)$? Describe the single transformation from $f(x)$ to $f(x - 2) + 3$ | |
| Key Mathematical Vocabulary | Intersection, asymptote | | |
| Personal Development | | Notes | Resources |
| Ensuring Loyalty is given to this subject in terms of time and effort in line with others subjects | | | |

