Edexcel AS Mathematics Graphs and transformations

Section 2: Transformations of graphs

Crucial points

1. **Be careful with signs and directions when dealing with translations**
   - Remember that the transformation $y = f(x) + a$ translates the graph of $y = f(x)$ upwards if a is positive and downwards if a is negative.
   - Remember that the transformation $y = f(x + a)$ translates the graph of $y = f(x)$ to the left if a is positive and to the right if a is negative. Students often get this the wrong way round.

2. **Be careful with scale factors when dealing with stretches**
   - Remember that the transformation $y = af(x)$ stretches the graph of $y = f(x)$ by a scale factor a parallel to the y-axis.
   - Remember that the transformation $y = f(ax)$ stretches the graph of $y = f(x)$ by a scale factor $\dfrac{1}{a}$ parallel to the x-axis. So if a is greater than 1, the graph is compressed, and if a is less than 1, the graph is stretched. Again, students often get this the wrong way round.

The Notes and examples explain why all these rules work.

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