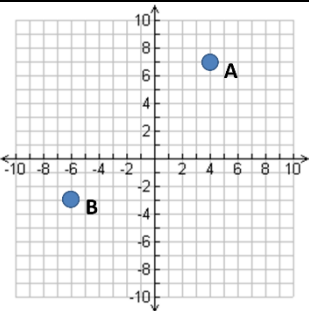
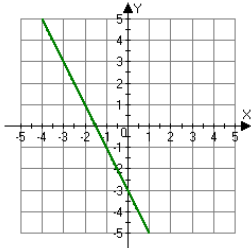
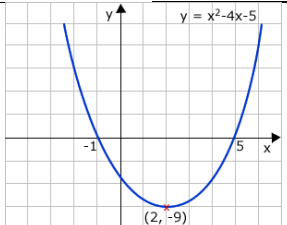
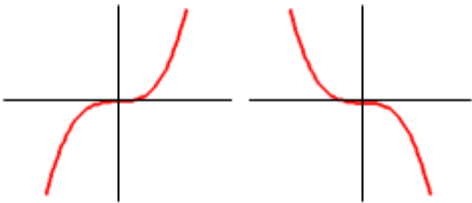
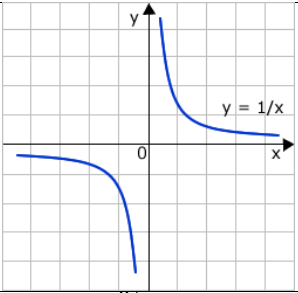
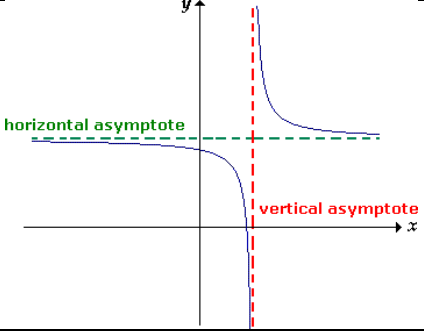


Core Knowledge

Topic: Graphs and Graph Transformations

Topic/Skill	Definition/Tips	Example
1. Coordinates	Written in pairs . The first term is the x-coordinate (movement across). The second term is the y-coordinate (movement up or down)	 A: (4,7) B: (-6,-3)
2. Linear Graph	Straight line graph. The equation of a linear graph can contain an x-term , a y-term and a number .	Example:  Other examples: $x = y$ $y = 4$ $x = -2$ $y = 2x - 7$ $y + x = 10$ $2y - 4x = 12$
3. Quadratic Graph	A ' U-shaped ' curve called a parabola . The equation is of the form $y = ax^2 + bx + c$, where a , b and c are numbers, $a \neq 0$. If $a < 0$, the parabola is upside down .	
4. Cubic Graph	The equation is of the form $y = ax^3 + k$, where k is an number . If $a > 0$, the curve is increasing . If $a < 0$, the curve is decreasing .	$a > 0$ $a < 0$ 
5. Reciprocal Graph	The equation is of the form $y = \frac{A}{x}$, where A is a number and $x \neq 0$. The graph has asymptotes on the x-axis and y-axis .	
6. Asymptote	A straight line that a graph approaches but never touches .	 horizontal asymptote vertical asymptote

Core Knowledge

7. Exponential Graph	The equation is of the form $y = a^x$, where a is a number called the base. If $a > 1$ the graph increases. If $0 < a < 1$, the graph decreases. The graph has an asymptote which is the x-axis.	
8. $y = \sin x$	Key Coordinates: $(0, 0)$, $(90, 1)$, $(180, 0)$, $(270, -1)$, $(360, 0)$ y is never more than 1 or less than -1. Pattern repeats every 360°.	
9. $y = \cos x$	Key Coordinates: $(0, 1)$, $(90, 0)$, $(180, -1)$, $(270, 0)$, $(360, 1)$ y is never more than 1 or less than -1. Pattern repeats every 360°.	
10. $y = \tan x$	Key Coordinates: $(0, 0)$, $(45, 1)$, $(135, -1)$, $(180, 0)$, $(225, 1)$, $(315, -1)$, $(360, 0)$ Asymptotes at $x = 90$ and $x = 270$ Pattern repeats every 360°.	
11. $f(x) + a$	Vertical translation up a units. $\begin{pmatrix} 0 \\ a \end{pmatrix}$	
12. $f(x + a)$	Horizontal translation <u>left</u> a units. $\begin{pmatrix} -a \\ 0 \end{pmatrix}$	
13. $-f(x)$	Reflection over the x-axis .	
14. $f(-x)$	Reflection over the y-axis .	

Links to shapes of graphs, plotting graphs, substitution, exact trig values, change in (x,y) coordinates. Percentage increase and decrease graphs