Guide to:
Cubic/reciprocal graphs

maths Links

Explanation:

A **cubic graph** ($y = ax^3 + bx^2 + cx + d$) forms a smooth S-shaped wave that goes from bottom-left to top-right when **a > 0** (or top-left to bottom-right when **a < 0**). Remember that cubing a negative number gives a **negative** result, e.g. $(-2)^3 = -8$.

A **reciprocal graph** ($y = \frac{k}{x}$, $x \neq 0$) has two separate curves in opposite quadrants (1st and 3rd if k > 0). It never touches the x-axis or y-axis; the axes **x = 0** and **y = 0** are called **asymptotes**.

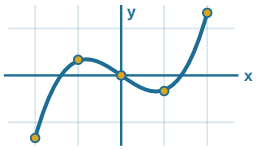
Example 1: Complete the table of values for the cubic graph $y = x^3 - 2x$ for $-2 \leq x \leq 2$.

Solution:

x	−2	−1	0	1	2
y	**−4**	**1**	**0**	**−1**	**4**

$x = -2$: $(-2)^3 - 2(-2) = \mathbf{-4}$

$x = 2$: $2^3 - 2(2) = \mathbf{4}$



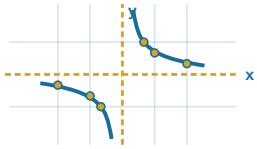
Example 2: Complete the table for $y = \frac{6}{x}$ and write down the equations of its asymptotes.

Solution:

x	−6	−3	−2	2	3	6
y	**−1**	**−2**	**−3**	**3**	**2**	**1**

Curves never touch axes:

Asymptotes: x = 0, y = 0



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