

2.4.4 Graph Families

Name: _____ Class: _____ Date: _____

KEY WORDS asymptote

<!-- Session 2 native-skill companion -->

Objective

Practise graph families within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Coordinate quadrants and basic graph families · Foundation

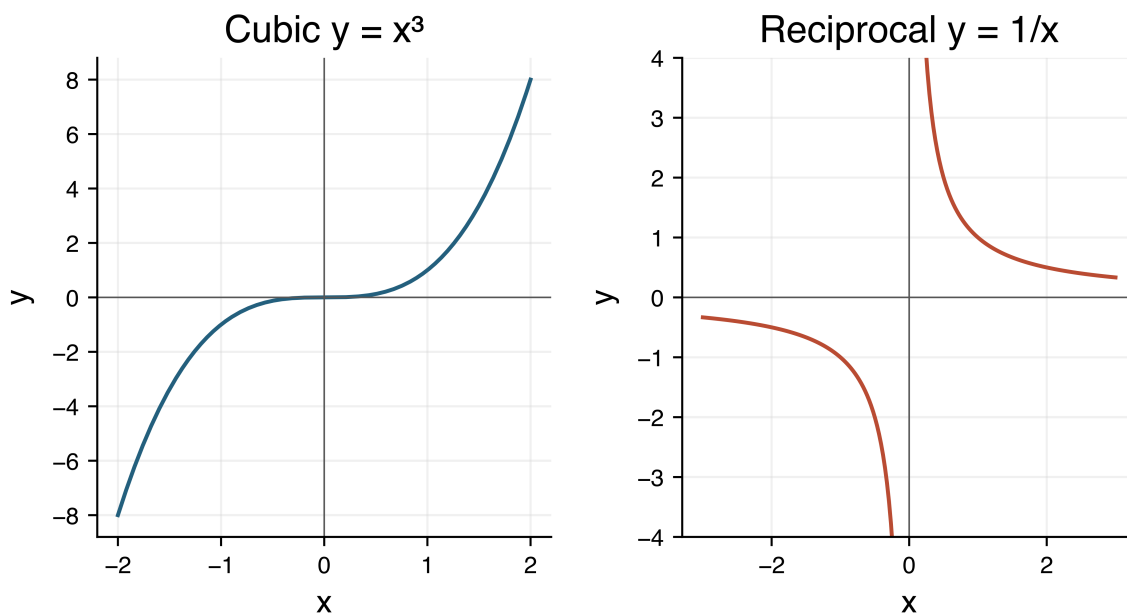
Coordinates are ordered (x,y). Signs identify the four quadrants. Use a value table, intercepts and symmetry to sketch a line, quadratic, cubic or reciprocal. For $y=1/x$, zero is excluded and the axes are asymptotes. Approximate intersections give graphical solutions.

$$y = x^3, \quad y = \frac{1}{x} \quad (x \neq 0)$$

For $y=x^3$, inputs -2,-1,0,1,2 give -8,-1,0,1,8. For $y=1/x$, inputs -2,-1,1,2 give -1/2,-1,1,1/2; never substitute zero. The point (-2,3) is in quadrant II. The graphs $y=x^2$ and $y=4$ meet at $x=-2$ and $x=2$. A quadratic $y=(x-3)(x-7)$ has roots 3,7 and symmetry line $x=5$.

Join a reciprocal branch smoothly on its own side of zero; never draw a segment through the excluded input. A graph table needs enough points to reveal a turning point or shape.

AQA A8/A11/A12 Foundation includes all quadrants, lines, quadratics, simple cubics and reciprocals. Higher exponential and degree-based trigonometric families are treated separately.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find x^3 at $x=-2$.

2.2 (Foundation) Find $1/x$ at $x=2$.

2.3 (Foundation) Find the positive intersection input of $y=x^2$ and $y=4$.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The graph of $y=1/x$ has a point at $x=0$.

Solutions

2.1 $(-2)^3 = -8$.

2.2 $1/2 = 0.5$.

2.3 $x^2 = 4$ gives ± 2 ; choose the positive value.

3.1 False. Substitution would require division by zero. Its domain excludes zero; $x=0$ is a vertical asymptote.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.