P1 Chapter 4: Transforming Graphs

Reciprocal Graphs

GCSE RECAP :: Reciprocal Graphs

Sketch $y = \frac{1}{x}$

?

Notice the distance between this line and the x-axis (i.e. the line $y = 0$) gradually decreases as the lines go off towards infinity. The line $y = 0$ is known as an **asymptote** of the graph.

Sketch $y = -\frac{3}{x}$

?

An asymptote is a line which the graph approaches but never reaches.

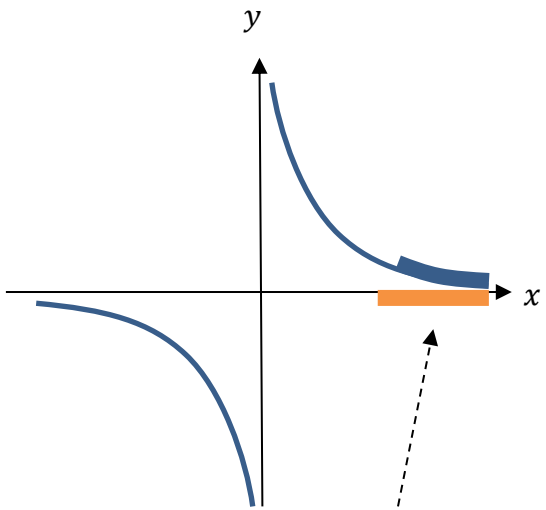
Asymptotes of $y = \frac{a}{x}$:

$y = 0$,

?

GCSE RECAP :: Reciprocal Graphs

Sketch $y = \frac{1}{x}$



Notice the distance between this line and the x-axis (i.e. the line $y = 0$) gradually decreases as the lines go off towards infinity. The line $y = 0$ is known as an **asymptote** of the graph.

An asymptote is a line which the graph approaches but never reaches.

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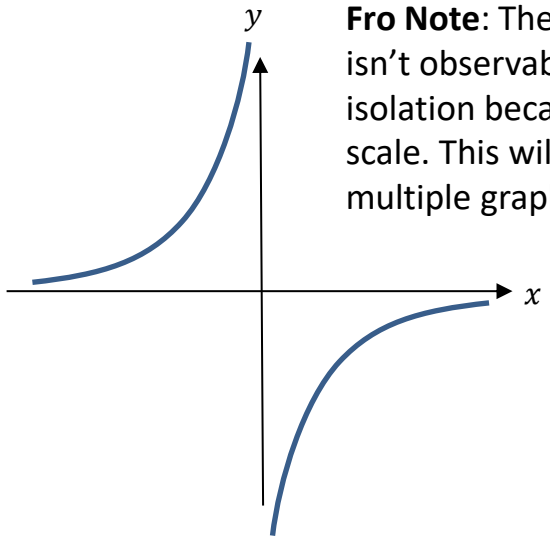


Fro Note: The scaling caused by the 3 isn't observable for this graph in isolation because the axes have no scale. This will only be observation for multiple graphs on the same axes.

Asymptotes of $y = \frac{a}{x}$:

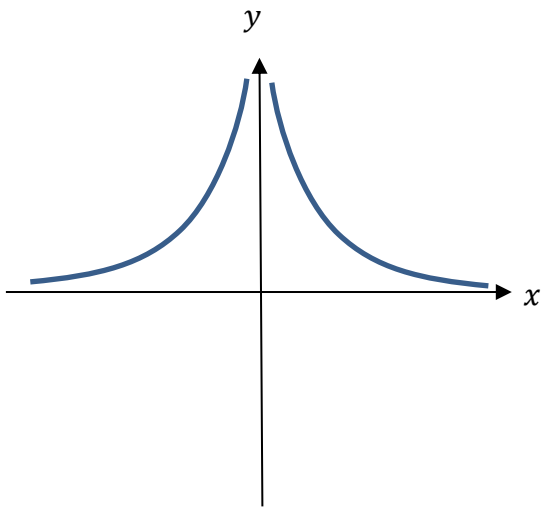
$y = 0,$

$x = 0$

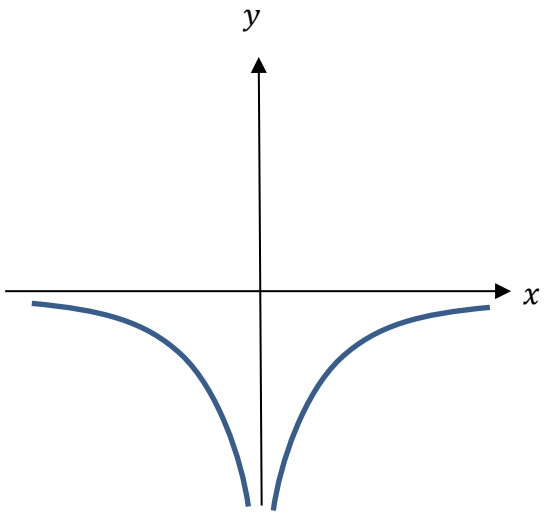
Reciprocal Graphs

Sketch $y = \frac{3}{x^2}$

This is new to the A Level 2017 syllabus.



Sketch $y = -\frac{4}{x^2}$



Hint: Note that anything squared will always be at least zero.

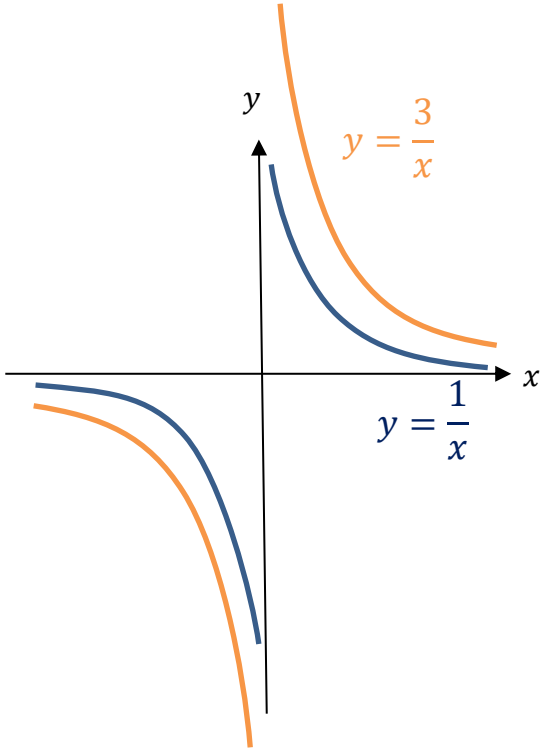
Reciprocal Graphs

On the same axes, sketch $y = \frac{1}{x}$ and $y = \frac{3}{x}$

?

Reciprocal Graphs

On the same axes, sketch $y = \frac{1}{x}$ and $y = \frac{3}{x}$



The y value for $y = \frac{3}{x}$ will be 3 times greater than $y = \frac{1}{x}$

Exercise 4.3

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Homework Exercise

1 Use a separate diagram to sketch each pair of graphs.

a $y = \frac{2}{x}$ and $y = \frac{4}{x}$

b $y = \frac{2}{x}$ and $y = -\frac{2}{x}$

c $y = -\frac{4}{x}$ and $y = -\frac{2}{x}$

d $y = \frac{3}{x}$ and $y = \frac{8}{x}$

e $y = -\frac{3}{x}$ and $y = -\frac{8}{x}$

2 Use a separate diagram to sketch each pair of graphs.

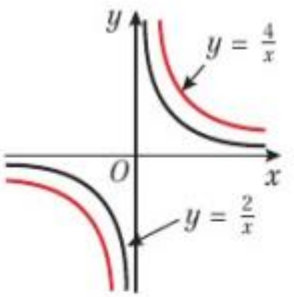
a $y = \frac{2}{x^2}$ and $y = \frac{5}{x^2}$

b $y = \frac{3}{x^2}$ and $y = -\frac{3}{x^2}$

c $y = -\frac{2}{x^2}$ and $y = -\frac{6}{x^2}$

Homework Answers

1 a



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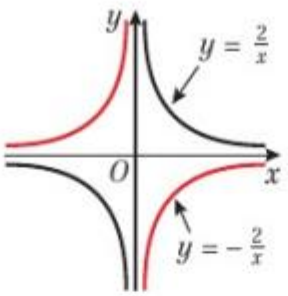

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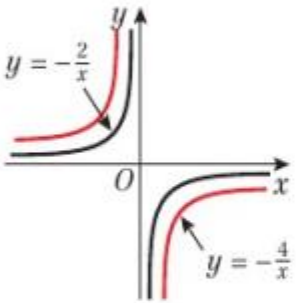

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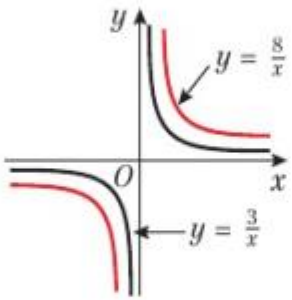

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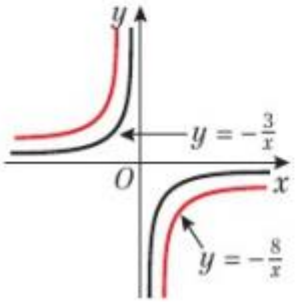
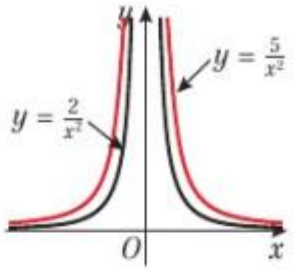


2 a



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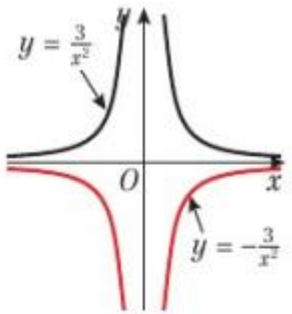
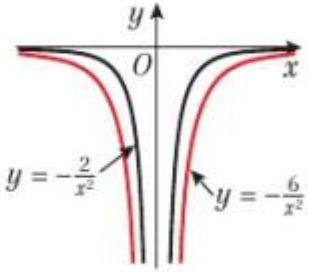
c