LINEAR & HYPERBOLIC FUNCTIONS 05 MAY 2014

Lesson Description

In this lesson we:

- Sketch linear and hyperbolic functions
- Look at the effect of a and q on straight line graphs and hyperbolae

Summary

Linear Graphs

y=mx+c / y=ax+q (both are acceptable)

- For a>0, the higher the value of 'a' (or m) the steeper the line.
- Changing the value of 'q' (or c-the y intercept) will imply a vertical movement of the original graph

Hyperbolae

y= $\frac{a}{x} + q$

- For a>0 the graph lies in the first and third quadrants.
- For a<0 the graph lies in the second and fourth quadrants.
- y= q is the horizontal asymptote
- x= 0 is the vertical asymptote
- The lines y = x+q and y=-x+q are the axes of symmetry of hyperbolae of the form
- y = $\frac{a}{x} + q$
- Changing values of 'a' will either stretch or contract the original graph vertically.

Test Yourself

Question 1

State whether the following statement is true or false. If false provide a reason for your answer.

The given or chosen y value is called the independent variable.

Question 2

State whether the following statement is true or false. If false provide a reason for your answer.

The y asymptote of f(x)=3x+4 is y=4

Question 3

State whether the following statement is true or false. If false provide a reason for your answer.

The horizontal asymptote of y= 3/x +2 is x=0 and the vertical asymptote is y=2

Question 4

State whether the following statement is true or false. If false provide a reason for your answer.

The y intercept of y=-4/x +2 is y =2

Question 5

The value of the y intercept of $x + 2y = 5$ is:

A 5

B 2

C 2.5

D 2/5

Improve your Skills

Question 1

Sketch the graph f(x) = 2x+1 with domain [-2;2)

Question 2

Draw the graph of g(x) = 4/x

Explain how the graph h(x) = 4/x + 2 compares to the original graph.

Draw h(x) on the same set of axes as g(x) showing all asymptotes and points of intersection.