1. Explain in your own words the meaning of each of the following:

2. Can the graph of  intersect :

a) a vertical asymptote?

b) a horizontal asymptote?

Explain your conclusions.

3. For the function whose graph is shown below, determine the following:



5. Evaluate the following limits.

6. Use limits to determine the horizontal and vertical asymptotes and any other points of discontinuity of the functions.

7. State the vertical asymptotes. Describe the behavior of on each side of the vertical asymptote(s).

## L4 Solutions

1. a) As gets increasingly large in the negative direction, the value of the function approaches .

b) As gets increasingly large in the positive direction the value of the function approaches .

c) As approaches from the right hand side, the value of the function gets increasingly large, approaching positive infinity.

d) As approaches from the left hand side, the value of the function becomes more negative, approaching negative infinity.

2. a) No, the function is undefined at a vertical asymptote.

b) Yes, a horizontal asymptote occurs for very large negative or positive values of Therefore, the graph may cross the asymptote when is small in relation to .

3. a)

b)

c)

d)

e)

5.

6.

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