Complete the table of numerical reciprocals for the following functions:

1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **X** | -2 | -1 | 0 | 1 | 2 |
| **f(x)** | -8 | -1 | 0 | 1 | 8 |
| **1/f(x)** |  |  |  |  |  |

2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **X** | -2 | -1 | 1 | 2 |
| **f(x)** | ½ | 0 | 2 | 3/2 |
| **1/f(x)** |  |  |  |  |

3.

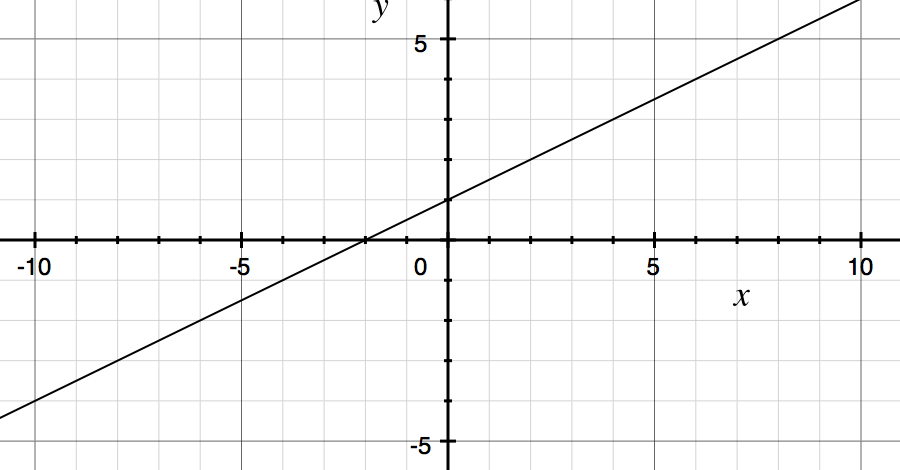
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **x** | ¼ | ½ | 2 | 4 |
| **f(x)** | 0 | 6 | 63 | 255 |
| **1/(f(x))** |  |  |  |  |
| **f(1/x)** |  |  |  |  |

4.

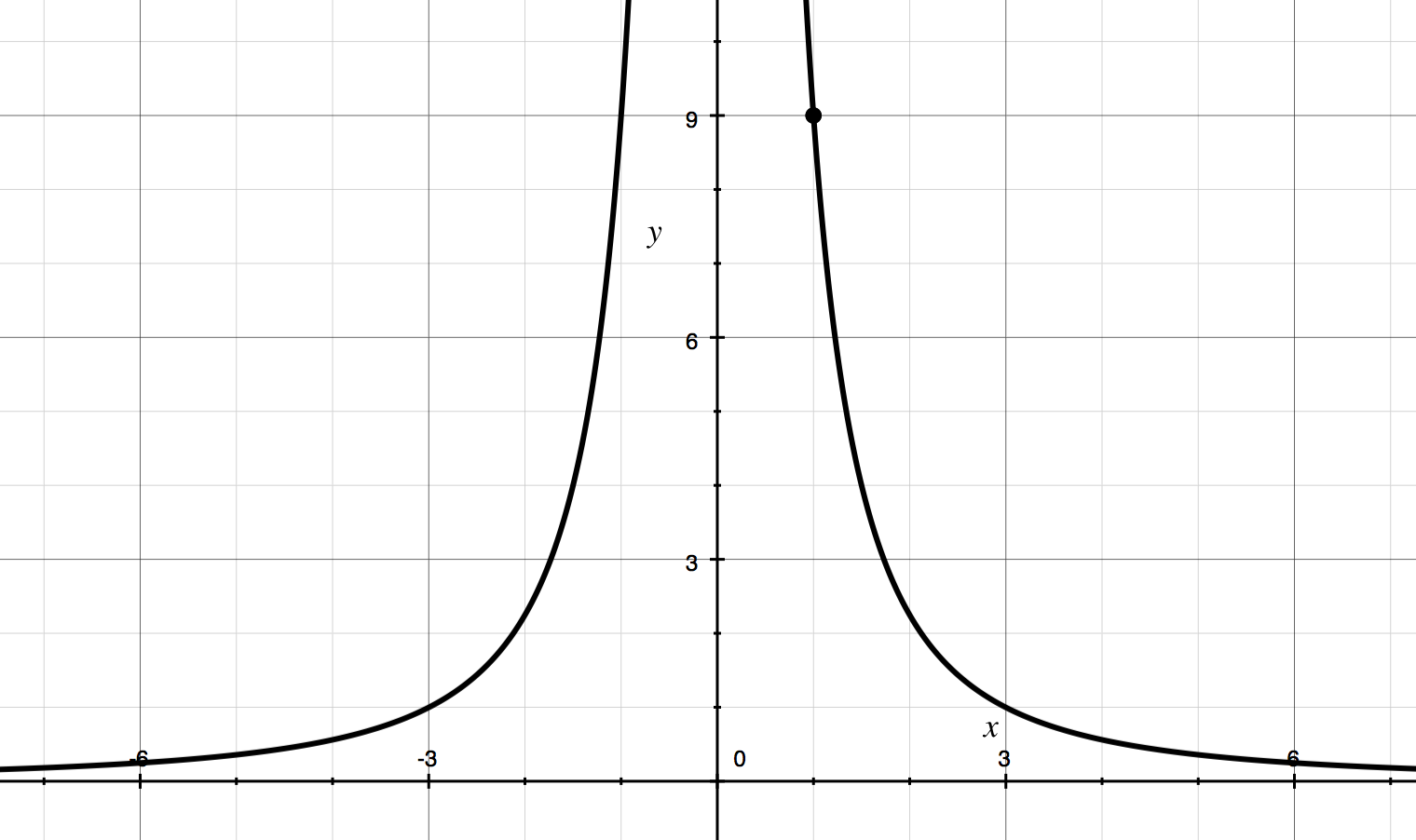
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **X** | -1 | ½ | 1 | 2 |
| **f(x)** | 1 | 4 | 5 | 7 |
| **1/(f(x))** |  |  |  |  |
| **f(1/x)** |  |  |  |  |

Freehand sketch the reciprocal of the given functions:

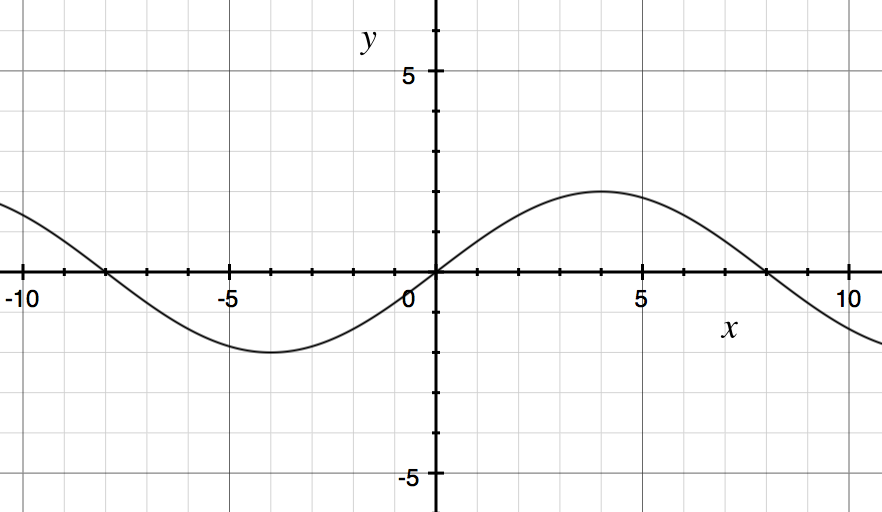
5.



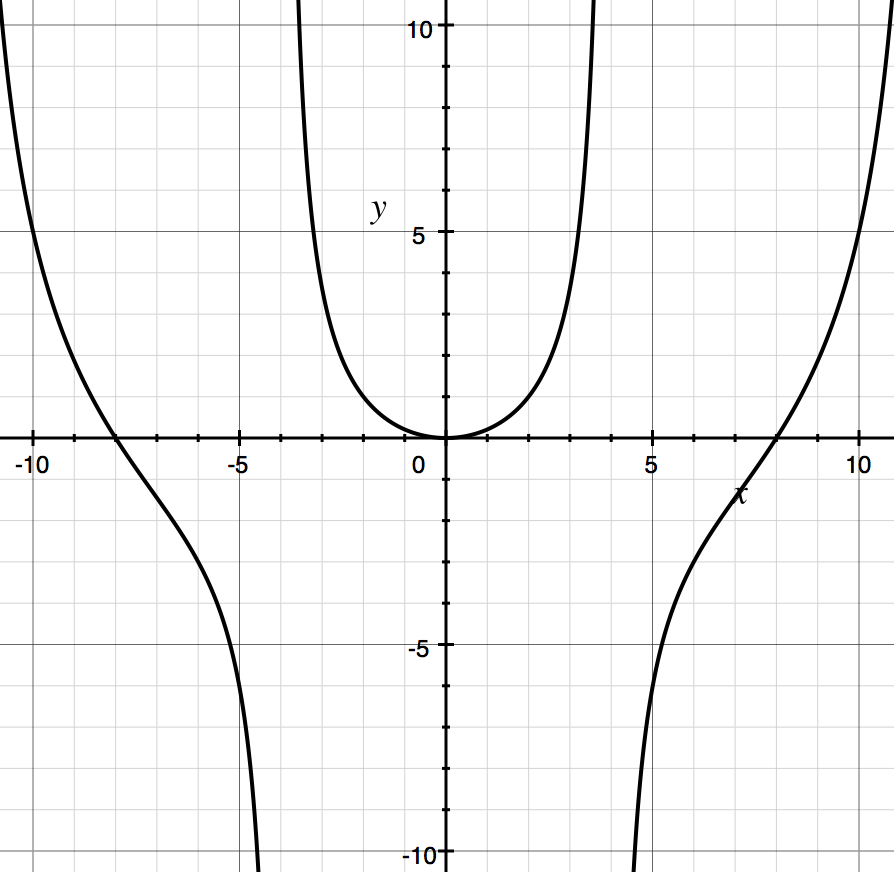
6.



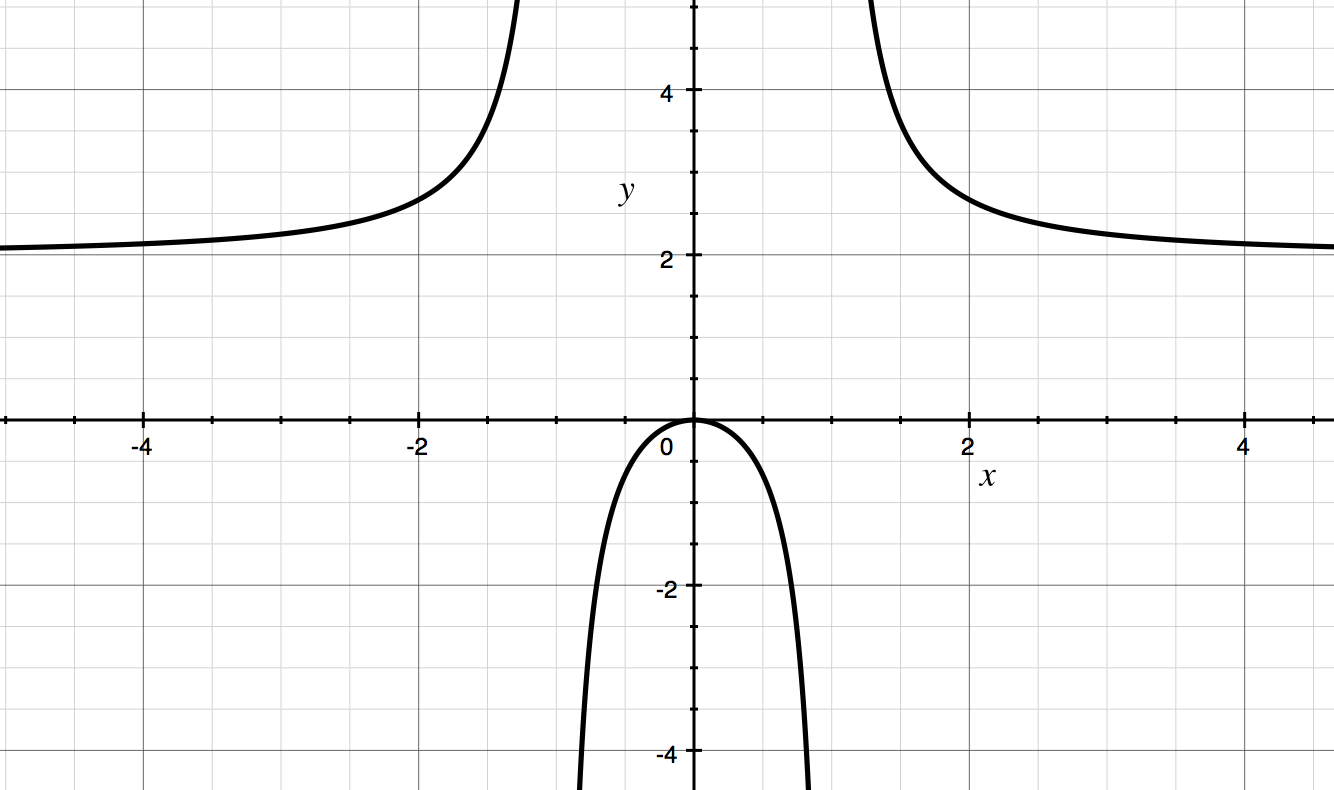
7.



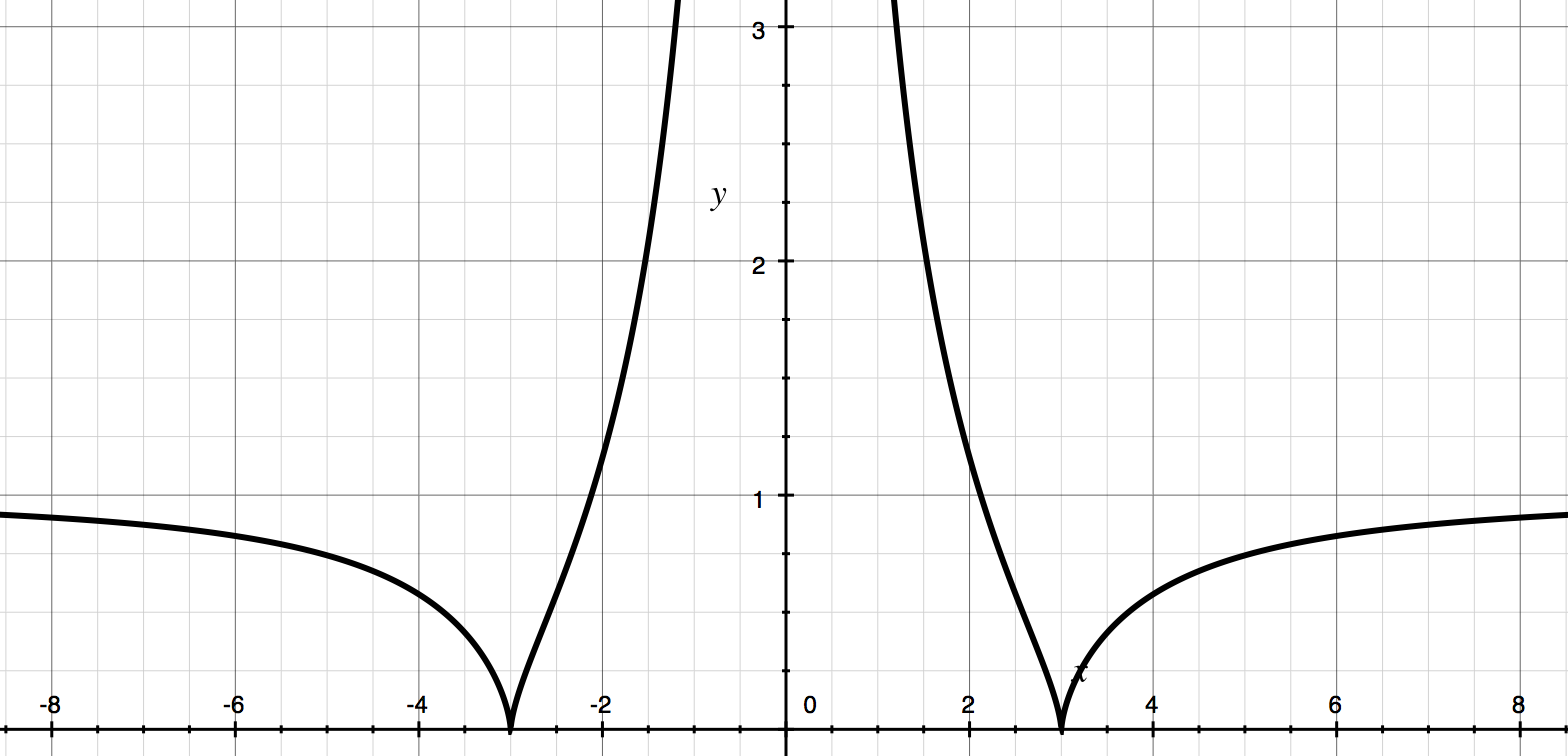
8.



9.



10.



Find the derivative of the reciprocal of the given function:

11. f(x) = 2x + 3

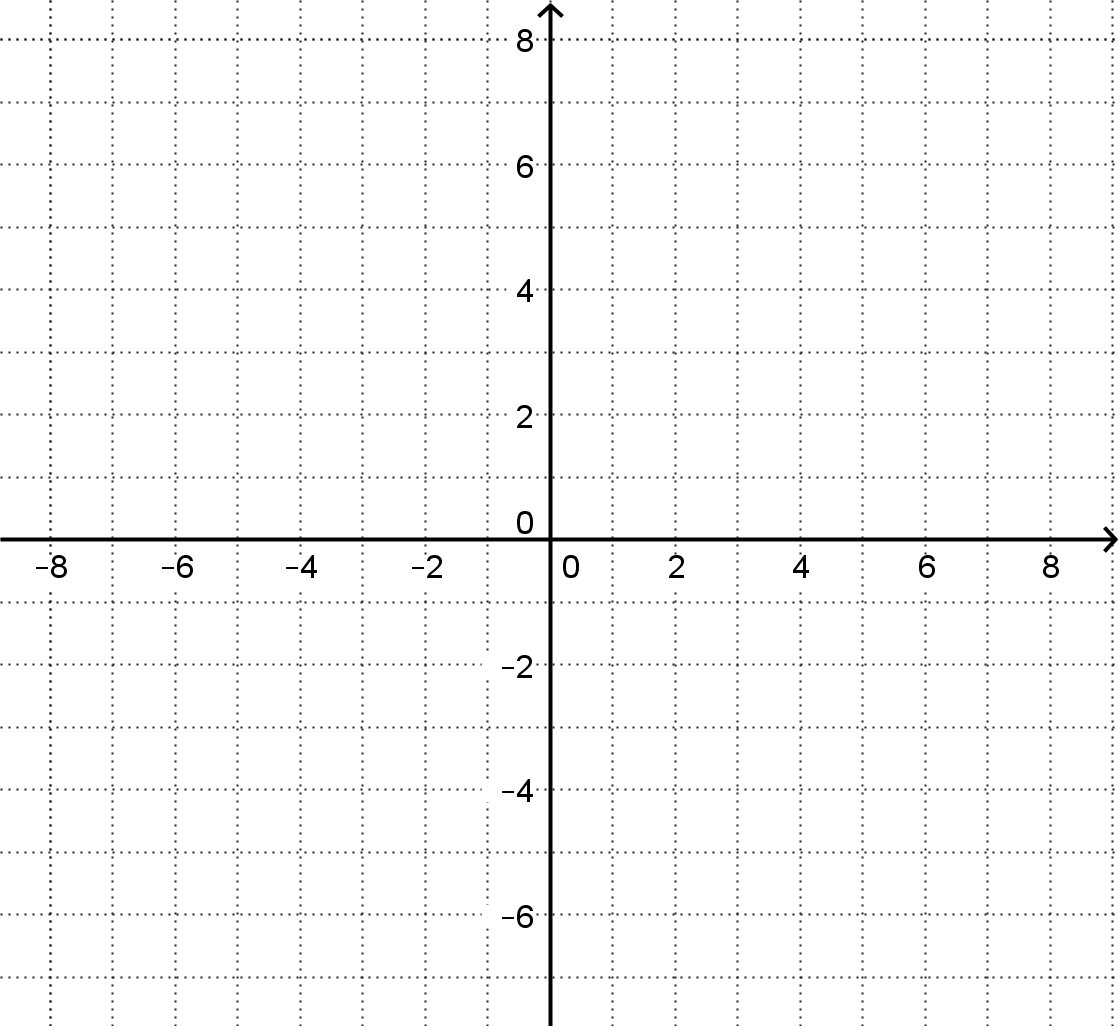
12. g(x) = -5x - 1

13. h(x) = 3x2 -5x + 1

14. j(x) = -6x3 -2x

How can you use the function variables of your TI-8\* to graph Y1’s reciprocal, without having to retype the entire function? Use your method to graph

Y1=(x^4-2x^3-52x^2+8x+256)/(32x+64) and its reciprocal.



Come up with a formula for finding the derivative of the reciprocal of any function.

When is the derivative of a function equal to the derivative of its reciprocal. Given two examples.

Find the local minimum of maximum of the given function, using the (easier) derivative of the reciprocal.

Suppose we have two functions, f and g.

A What is the derivative of f(g(x))?

B What is the derivative of 1/(f(g(x)))?

C What is the derivative of f(1/(g(x)))?

D What is the derivative of 1/(f(1/(g(x))))?

How would A-D change if every x was replaced with 1/x?