

SECTION 1.6 RECIPROCAL OF QUADRATIC FUNCTIONS

- i) Concept of Reciprocal Functions
- ii) Asymptotes, Invariant Points,
- iii) Graphing the Reciprocal of Linear and QF
- iv) Domain and Range

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I) WHAT IS A RECIPROCAL ?

- A reciprocal is a number you get when switching

Ex: Find the reciprocal of each number:

i) 10 ii) 0.5 v) -0.5

ii) 1 iv) 0 vi) -1

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II) THE RECIPROCAL OF A FUNCTION? $y = \frac{1}{f(x)}$

- When finding the reciprocal of a function,

$f(x) = 3x + 11 \rightarrow$


$f(x) = 8x^2 - 5x + 13 \rightarrow$

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Section 1.6 Reciprocal of Quadratic Functions

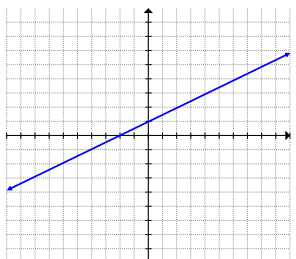

III) GRAPHING RECIPROCAL FUNCTIONS $y = \frac{1}{f(x)}$

- The reciprocal function takes the reciprocal of all the y-coordinates of a function
- When graphing a reciprocal function, there are a three main steps:



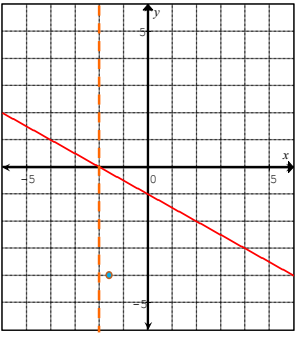

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Ex#1) GRAPH $y = \frac{1}{0.5x+1}$

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PRACTICE: GIVEN THE FOLLOWING GRAPH, DRAW THE RECIPROCAL FUNCTION

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Section 1.6 Reciprocal of Quadratic Functions

PRACTICE: GRAPH THE FOLLOWING $y = \frac{1}{x^2 - 4}$

A coordinate plane with x and y axes ranging from -5 to 5. A red parabola opens upwards with its vertex at (0, -4). Two vertical dashed orange lines represent asymptotes at x = 2 and x = -2. The parabola approaches these asymptotes as x goes to positive or negative infinity.

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GRAPH THE RECIPROCAL OF EACH PARABOLA

Two coordinate planes side-by-side. The left one shows a red parabola opening upwards with vertex at (0, 1) and a vertical dashed green line at x = 0. The right one shows a red parabola opening downwards with vertex at (0, -1) and a vertical dashed green line at x = 0.

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Ex#) GIVEN THE FOLLOWING GRAPH F(X), GRAPH THE RECIPROCAL FUNCTION.

A coordinate plane with a red piecewise function. The function has a horizontal segment at y = 1 for x < -1, a downward-sloping segment from (-1, 1) to (-1, -1), a horizontal segment at y = -1 for -1 < x < 2, an upward-sloping segment from (2, -1) to (2, 1), and a horizontal segment at y = 1 for x > 2. A vertical dashed green line is at x = 2.

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GIVEN THE FOLLOWING FUNCTION, INDICATE THE DOMAIN AND RANGE:

$$i) y = \frac{1}{3x - 4}$$

$$ii) y = \frac{1}{x^2 - 4}$$

$$iii) y = \frac{1}{x^2 + 9}$$

$$iv) y = \frac{1}{(x - 3)^2}$$

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