UNIT 4 WORKSHEET 14
Finding Intercepts of Rational Functions

We have found that the zeros of the denominator of a rational function are the vertical asymptotes of the function. The zeros of the numerator on the other hand, are the x intercepts of the function.

Find all x and y intercepts of the function $f_{(x)} = \dfrac{x^2 - 9}{x - 1}$.

$$f_{(x)} = \frac{(x+3)(x-3)}{x-1}$$

Write out the function in completely factored form.

Now, find the zeros of the numerator

$x = -3 \quad and \quad x = 3$

These are the x intercepts of the function.

Look at the original function.

$$f_{(x)} = \frac{x^2 - 9}{x - 1}$$

From here, substitute zero for x, and find the y intercept, which in this case will be the ratio of the two constants.

$$y = 9$$

This is the y intercept of the function. In this case, it is the ratio of the two remaining constants once zero is substituted in for x. If there is no constant in the denominator, then there will be no y intercept as x=0 is a vertical asymptote and the graph is undefined at the y axis.

The x intercepts are $(-3,0)\ and\ (3,0)$

The y intercept is $(0,9)$

As demonstrated above, the y intercept of a rational function is the ratio of the two constants. Like always, substitute zero for x, and solve for y to find the y intercept.

Find the x and y intercepts of each rational function.

A) $f_{(x)} = \dfrac{x-7}{x+5}$

B) $f_{(x)} = \dfrac{3}{x^2 - 4}$

C) $f_{(x)} = \dfrac{x^2}{x-5}$

D) $f_{(x)} = \dfrac{2x^2 - 5x + 3}{x-1}$

E) $f_{(x)} = \dfrac{x-8}{x^3 - x^2 - 12x}$

F) $f_{(x)} = \dfrac{x^3}{x^2 - 7x + 12}$