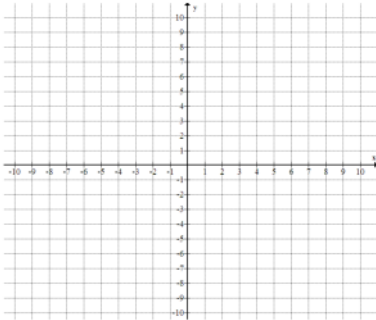


C_23 Graphing Rational Functions

Graphing Rational Functions – putting it all together!

$$y = \frac{2x^3 - 7x^2 - 15x}{x^3 - x^2 - 20x}$$

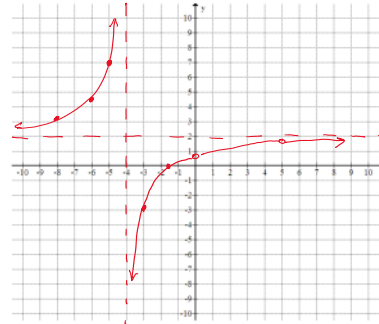
- Factor and simplify the given equation. Identify all NPVs.
- Find the equation of any vertical asymptotes
- Find the equation of the horizontal asymptote
- State the coordinates of any POD
- Find the coordinates of any x-intercepts and of the y-intercept
- Graph the function on the provided grid. Include a table with at least 4 other points on the graph besides the intercepts.



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$y = \frac{x(2x^2 - 7x - 15)}{x(x^2 - x - 20)}$
 $y = \frac{x(2x+3)(x-5)}{x(x-5)(x+4)}$
 NPVs: $x=0, x=-4, x=5$

$-3x$
 $-10 \quad 3$
 $2x^2 - 10x + 3x - 15$
 $2x(x-5) + 3(x-5)$
 $(x-5)(2x+3)$

POD when $x=0$ and when $x=5$
 $y = \frac{2(0)+3}{0+4} = \frac{3}{4}$ → $(0, 3/4)$
 $y = \frac{2(5)+3}{5+4} = \frac{13}{9}$ → $(5, 13/9)$

x-int, let $y=0$
 $(x+4)(0) = \frac{2x+3}{x+4}(x+4)$
 $0 = 2x+3$ → $x = -3/2$ → $(-3/2, 0)$
 y-int, let $x=0$
 $\frac{2(0)+3}{-8+4} = \frac{3}{-4} = -3/4$ → $(0, -3/4)$

$y = \frac{2x+3}{x+4}$

x	y
-5	$\frac{2(-5)+3}{-5+4} = \frac{-7}{-1} = 7$
-3	$\frac{2(-3)+3}{-3+4} = \frac{-3}{1} = -3$
-6	$\frac{2(-6)+3}{-6+4} = \frac{-9}{-2} = 9/2$
-8	$\frac{2(-8)+3}{-8+4} = \frac{-13}{-4} = 13/4$ or $3 1/4$

Oh good - Desmos got it right, too! 😊

