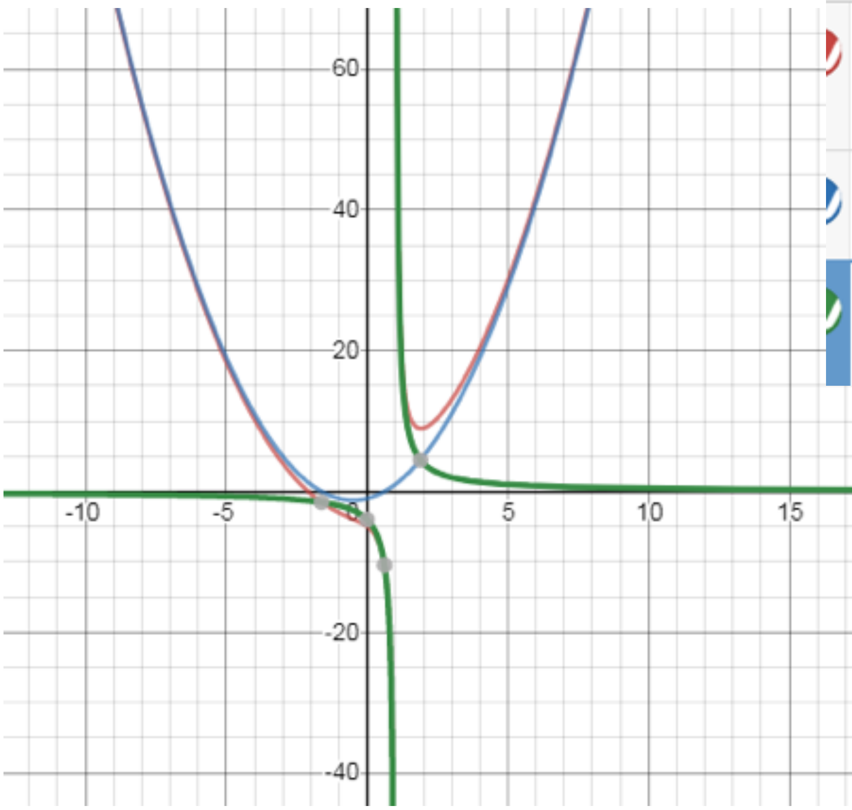
$$y = \frac{x^3-2x+5}{x-1} = x^2+x-1+\boxed{\frac{4}{x-1}}$$

as x gets large

$$\begin{array}{r|rrrr} 1 & 1 & 0 & -2 & 5 \\ & & 1 & 1 & -1 \\ \hline & 1 & 1 & -1 & 4 \end{array}$$

as $x \to 1$

November 13, 2019



$$y = \frac{\left(x^3 - 2x + 5\right)}{x - 1}$$

$$y = x^2 + x - 1$$

$$y = \frac{4}{x - 1}$$

$$y = \frac{P(x)}{D(x)} = \underline{\underline{Q(x)}} + \underline{\underline{\frac{R(x)}{D(x)}}}$$

Dominant as $x \to \infty$ or $x \to -\infty$

Dominant as $x \to$ VA.

Analyze

$$y = \frac{2x-5}{x+4} = \frac{2x+8-8-5}{x+4}$$

$$= 2 - \frac{13}{x+4}$$

Exercise 8 Suppose that $P(x/3) = x^2 + x + 1$. What is the sum of all values of x for which $P(3x) = 7$?

(A) $-\frac{1}{3}$ **(B)** $-\frac{1}{9}$ **(C)** 0 **(D)** $\frac{5}{9}$ **(E)** $\frac{5}{3}$

$$7 = (9x)^2 + 9x + 1$$

$$\text{sum} = \frac{-b}{a}$$

$$7 = 81x^2 + 9x + 1$$

$$= \frac{-9}{81}$$

$$0 = 81x^2 + 9x - 6$$

$$\frac{2}{9} \quad \frac{-3}{9} = \boxed{\frac{-1}{9}} \quad (9x-2)(9x+3)$$

Exercise 9 For how many values of the coefficient a do the equations

$$0 = x^2 + ax + 1 \quad \text{and} \quad 0 = x^2 - x - a$$

have a common real solution?

(A) 0 **(B)** 1 **(C)** 2 **(D)** 3 **(E)** infinitely many

$ax + 1 = -x - a$

$ax + x + a + 1 = 0$

$(a+1)(x+1) = 0$

$a = -1$

or

$x = -1$

If $\cancel{a = -1}$

$x^2 - x + 1 = 0$

$b^2 - 4ac < 0$