BECA / Huson / Algebra 2: Polynomial functions Name:
5 March 2024

PreQuiz: Rational functions (optional plus standard)

1. Use polynomial long division to find an expression of the form $ax^3 + bx^2 + cx + d + \frac{e}{x+f}$ with a, b, c, d, e, f integers that is equivalent to $\dfrac{x^4 + 2x^3 - 7x^2 + x - 10}{x + 3}$ for $x \neq -3$.

2. Solve for x.

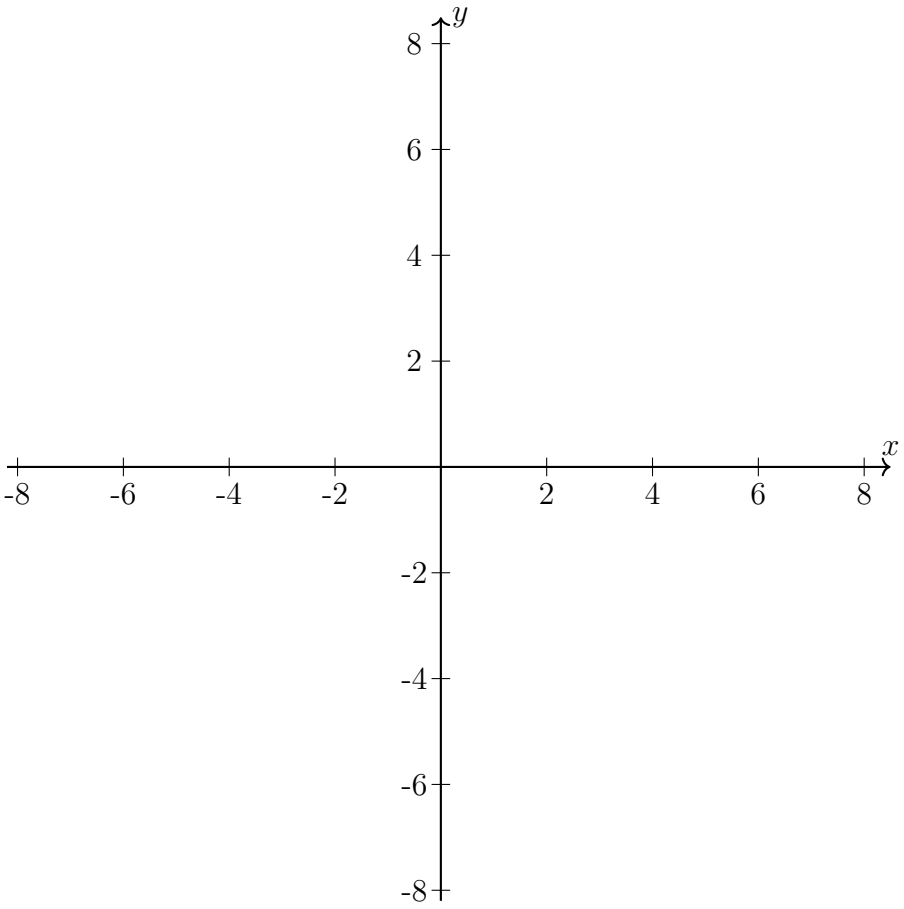
$$\frac{3}{x-4} = \frac{x-5}{x}$$

3. Given the rational function $r(x) = 3 + \dfrac{x-1}{x+2}$.

   (a) Sketch a graph of the function.

   (b) Mark the vertical asymptote as dotted line and label it with its equation.

   (c) Explain why the asymptote is located there.



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4. Which expression is equivalent to $(x+2)^2 - 5(x+2) + 6$?
   (a) $x(x+1)$
   (b) $(x-3)(x+2)$
   (c) $(x-4)(x+3)$
   (d) $(x-6)(x+1)$

5. The expression $\dfrac{x^4 - 5x^2 + 4x + 14}{x+2}$ is equivalent to
   (a) $x^3 - 2x^2 - x + 6 - \dfrac{2}{x+2}$
   (b) $x^3 - 5x + 4 - \dfrac{14}{x+2}$
   (c) $x^3 + 2x^2 - x + 2 + \dfrac{18}{x+2}$
   (d) $x^3 + 2x^2 - 9x + 22 - \dfrac{30}{x+2}$

6. What is the solution set of the equation $\dfrac{x+2}{x} + \dfrac{x}{3} = \dfrac{2x^2+6}{3x}$?
   (a) $\{-3\}$
   (b) $\{-3, 0\}$
   (c) $\{3\}$
   (d) $\{0, 3\}$