BECA / Huson / Algebra 2: Polynomial & Rational Functions Name:
9 January 2024

2.27 Homework: Rational expressions exam review

1. Use polynomial long division to find an expression of the form $ax+b+\frac{c}{x+d}$ with a, b, c, d integers that is equivalent to $\dfrac{3x^3+19x^2+15x}{x^2+4x}$ for $x \neq -4$ or 0.

A2-F.BF.2 Write arithmetic and geometric sequences with recursive formulas

2. Write a recursive definition of the sequence $a_1 = 2$, $a_2 = 6$, $a_3 = 18$, $a_4 = 54, \ldots$

3. A geometric sequence begins $5, 10, 20, \ldots$.
   (a) Write the first six terms of the sequence.

   (b) Find the common ratio r.

   (c) Find the sum of the first six terms of the sequence.

   (d) Find the sum of the first 20 terms of the sequence.

4. Find all values of x that make the equation true.

$$\frac{x-3}{x} = \frac{2}{x-6}$$

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

   (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.