LESSON MAKER PRO

Rational Rewrite Lab

Use polynomial division to separate a quotient and remainder.

HIGH SCHOOL · HSA-APR.D.6

CCSS.Math.Content.HSA-APR.D.6 "Rewrite simple rational expressions in different forms; write a (x) / b (x) in the form q (x) + r (x) / b (x), where a (x), b (x), q (x)..."

NAME _____ DATE _____

QUOTIENT PLUS REMAINDER

Divide the numerator polynomial by the denominator polynomial. Write the result as quotient + remainder/denominator, and make sure the remainder has a lower degree than the denominator.

WORKED EXAMPLE

Rewrite (7x^2 + 23x + 8)/(x + 6).

1. Divide leading terms: 7x^2 / x = 7x.
2. Multiply 7x(x + 6) = 7x^2 + 42x, then subtract to get -19x + 8.
3. Divide -19x / x = -19, then multiply -19(x + 6) = -19x - 114.
4. Subtract to get a remainder of 122.

Answer: 7x - 19 + 122/(x + 6)

PRACTICE 6 problems

1 Rewrite (x^2 + 14x + 31)/(x + 5).

ANSWER _____

2 Rewrite (3x^2 - x + 10)/(x - 4).

ANSWER _____

3 Rewrite (3x^2 + 14x - 5)/(x + 5).

ANSWER _____

4 Rewrite (x^3 + 2x^2 - 9x + 12)/(x - 2).

ANSWER _____

5 Rewrite (x^3 + 5x^2 + 9x + 13)/(x^2 + x + 3).

ANSWER _____

6 Rewrite (2x^3 - 3x^2 + 4x + 9)/(x^2 - x + 2).

ANSWER _____

APPLY IT Show your work

1 A student music channel uses S(d) = (d^2 + 13d + 41)/(d + 5) to model playlist saves after d days. Rewrite S(d) as a polynomial plus a fraction.

WORK SPACE

ANSWER _____

2 An esports club uses P(t) = (3t^2 + 9t + 18)/(t - 2) to model points earned after t tournament rounds. Rewrite P(t) as a polynomial plus a fraction.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Rewrite (5x^4 - 9x^3 + 9x^2 + 15x - 22)/(x^2 - 2x + 3). Then explain why the remainder is valid.

_____

_____

ANSWER KEY

Rational Rewrite Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Rewrite (x^2 + 14x + 31)/(x + 5).	**x + 9 - 14/(x + 5)**
2	Rewrite (3x^2 - x + 10)/(x - 4).	**3x + 11 + 54/(x - 4)**
3	Rewrite (3x^2 + 14x - 5)/(x + 5).	**3x - 1**
4	Rewrite (x^3 + 2x^2 - 9x + 12)/(x - 2).	**x^2 + 4x - 1 + 10/(x - 2)**
5	Rewrite (x^3 + 5x^2 + 9x + 13)/(x^2 + x + 3).	**x + 4 + (2x + 1)/(x^2 + x + 3)**
6	Rewrite (2x^3 - 3x^2 + 4x + 9)/(x^2 - x + 2).	**2x - 1 + (-x + 11)/(x^2 - x + 2)**

PART 2 · APPLY IT

1. **S(d) = d + 8 + 1/(d + 5)** Divide d^2 + 13d + 41 by d + 5. The quotient is d + 8 and the remainder is 1.
2. **P(t) = 3t + 15 + 48/(t - 2)** Divide 3t^2 + 9t + 18 by t - 2. The quotient is 3t + 15 and the remainder is 48.

CHALLENGE

5x^2 + x - 4 + (4x - 10)/(x^2 - 2x + 3). The remainder is valid because 4x - 10 has degree 1, which is less than the denominator's degree of 2.

Accept equivalent forms, including a remainder written with terms in a different order. For exact division, accept the quotient alone or the quotient plus 0 divided by the original denominator.