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

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

WORK SPACE AND ANSWER

ANSWER KEY # Rational Rewrite Lab

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.