LESSON MAKER PRO

Divide and Conquer

Simplify polynomial quotients one term at a time.

HIGH SCHOOL · MA.912.AR.1.4

MA.912.AR.1.4 "Divide a polynomial expression by a monomial expression with rational number coefficients."

NAME _____ DATE _____

DIVIDE EVERY TERM

Divide each term in the polynomial by the monomial. Divide the coefficients, then subtract the exponent of x in the divisor from each exponent of x in the dividend. When dividing by a fraction, multiply by its reciprocal.

WORKED EXAMPLE

(34x^5 - 51x^4 + 68x^3) / (17x)

1. (34/17)x^(5-1) - (51/17)x^(4-1) + (68/17)x^(3-1)
2. = 2x^4 - 3x^3 + 4x^2
3. Each term is divided by 17x.

Answer: 2x^4 - 3x^3 + 4x^2

PRACTICE 6 problems

1 (35x^4 - 49x^3) / (7x)

ANSWER _____

2 (-44x^5 + 22x^3) / (-11x)

ANSWER _____

3 ((10/9)x^6 - (25/18)x^5) / ((5/18)x)

ANSWER _____

4 ((-33/7)x^7 + (55/7)x^6) / ((11/14)x)

ANSWER _____

5 (63x^8 + 27x^7 - 45x^6) / (-9x^2)

ANSWER _____

6 ((45/14)x^9 - (15/7)x^8) / (-(5/14)x^3)

ANSWER _____

APPLY IT Show your work

1 An esports club models its total prize fund as (21/4)x^3 + (7/2)x^2 dollars. The club assigns (7/4)x equal prize shares. Write a simplified expression for the dollars in each prize share.

WORK SPACE

ANSWER _____

2 A student film crew models its total editing time as (15/11)x^4 - (10/11)x^3 + (25/11)x^2 minutes. The work is split equally among (5/11)x editing stations. Write a simplified expression for the minutes of work at each station.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Divide, then explain why the quotient has no x^5 term: ((7/9)x^8 - (14/27)x^6 + (35/18)x^5) / (-(7/18)x^2).

ANSWER KEY

Divide and Conquer

HIGH SCHOOL · MA.912.AR.1.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	(35x^4 - 49x^3) / (7x)	**5x^3 - 7x^2**
2	(-44x^5 + 22x^3) / (-11x)	**4x^4 - 2x^2**
3	((10/9)x^6 - (25/18)x^5) / ((5/18)x)	**4x^5 - 5x^4**
4	((-33/7)x^7 + (55/7)x^6) / ((11/14)x)	**-6x^6 + 10x^5**
5	(63x^8 + 27x^7 - 45x^6) / (-9x^2)	**-7x^6 - 3x^5 + 5x^4**
6	((45/14)x^9 - (15/7)x^8) / (-(5/14)x^3)	**-9x^6 + 6x^5**

PART 2 · APPLY IT

1. **3x^2 + 2x dollars per prize share** Divide each term of the prize-fund expression by (7/4)x. The quotient is 3x^2 + 2x.
2. **3x^3 - 2x^2 + 5x minutes per editing station** Divide each term of the total-time expression by (5/11)x. The quotient is 3x^3 - 2x^2 + 5x.

CHALLENGE

-2x^6 + (4/3)x^4 - 5x^3. The quotient has no x^5 term because the dividend has no x^7 term.

Accept equivalent simplified quotients with terms in any order. Require students to divide every term and reduce rational coefficients.