4.5 Dividing Polynomials by Monomials

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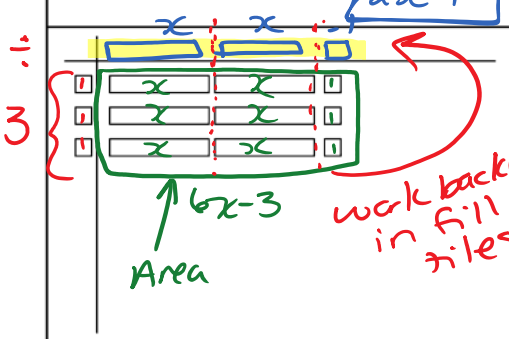
2+ terms — 1 term

4.5 DIVIDING POLYNOMIALS BY MONOMIALS

Name:_____ Block_____

Example #1: $\frac{6x-3}{3}$

Method #1: Algebra Tiles	Method #2: Algebraically
2x-1  3 ÷ 6x-3 Area — work backwards to fill in tiles.	sign stays the same: $\frac{6x-3}{3} = \frac{6x}{3} - \frac{3}{3}$ — distribute the denominator: $= \frac{6x}{3} - \frac{3}{3}$ — $\frac{6}{3} = 6 \div 3 = 2$ — $3 \div 3 = 1$ — $= 2x - 1$

Example #2

① distribute denominator

a) $\frac{30k^2-18k}{-6k} = \frac{30k^2}{-6k} - \frac{18k}{-6k}$ (-5, -3) — #cancel method

$= -5k - (-3)$

$= -5k + 3$

b) $\frac{-6x^2+9x}{3x} = \frac{-6x^2}{3x} + \frac{9x}{3x}$ — cancel top + bottom — $-6 \div 3 = -2$ — $9 \div 3 = 3$

$\frac{x^2}{x} = \frac{x \cdot x}{x} = x$ — $= x^{2-1} = x$

$= -2x + 3$

c) $\frac{15x-10}{5} = \frac{15x}{5} - \frac{10}{5}$ — nothing to cancel — $15 \div 5 = 3$ — $10 \div 5 = 2$

$= 3x - 2$

d) $\frac{14m^2+8m}{-2m} = \frac{14m^2}{-2m} + \frac{8m}{-2m}$ — $m^2 \div m^1 = m^{2-1} = m^1$ — cancel $m \div m = 1$ — $14 \div -2 = -7$ — $8 \div -2 = -4$

$= -7m + (-4)$

$= -7m - 4$

$\frac{x^2}{x} = \frac{x \cdot x}{x} = x$

PRACTICE

394. $\frac{5x^2+10xy-25x}{5x}$

$= x+2y-5$

395. $\frac{12x^2+10}{x}$

$= 12x + \frac{10}{x}$

$\frac{12x^2}{x} + \frac{10}{x}$

396. $\frac{-14y^2-49xy+28yz}{-7y}$

$= 2y+7x-4z$

$\frac{10}{x} \neq 10 \neq 10x$

$10 \div x$ $\quad$ $10 \times x$

a) $\frac{-36y^2+10.8y}{6y}$

$= -6y + 1.8$

b) $\frac{4s^2-8st+12s}{-8s}$

$= -\frac{1}{2}s + t - \frac{3}{2}$ OR

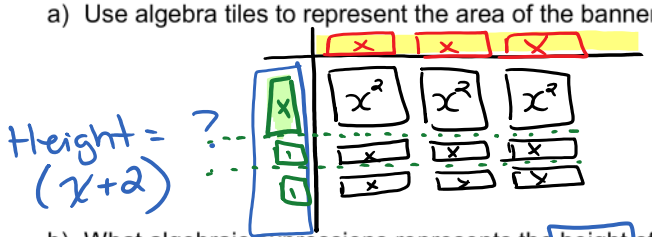
$= -0.5s + t - 1.5$

WORD PROBLEMS WITH DIVISION AND POLYNOMIALS:

Example #2:

A business sells an advertising banner where the area of the banner can be represented by the expression $3x^2 + 6x$, and the length is $3x$.

a) Use algebra tiles to represent the area of the banner, and show the length:



Height = ? $(x+2)$

Area: $3x^2 + 6x$

b) What algebraic expressions represents the height of the banner?

$H = \frac{3x^2+6x}{3x}$

$A = L \cdot H$

$H = \frac{A}{L}$

b) Calculate the area and height of a banner when the length is 120 cm.

$A = 3x^2 + 6x$ *sub-in valued x

$A = 3(40)^2 + 6(40)$

$A = 4800 + 240 = 5040\,cm^2$

$H = \frac{3x^2+6x}{3x}$

$H = \frac{3x^2}{3x} + \frac{6x}{3x}$

$L = 3x$ (1)

$L = 120$

$\frac{120}{3} = \frac{3x}{3}$

$\frac{120}{3} = x$ so, $x = 40$

$H = x + 2$ ✓

$H = (40) + 2$

$H = 42$

Homework

ASSIGNMENT #5
Section 4.5 pg 146-149

Required questions	Extra practice	Extension
1, 2, 6, 8, 9, 10, 11, 12, 13, 17	3, 4, 5, 7, 14, 15, 16	19, 20