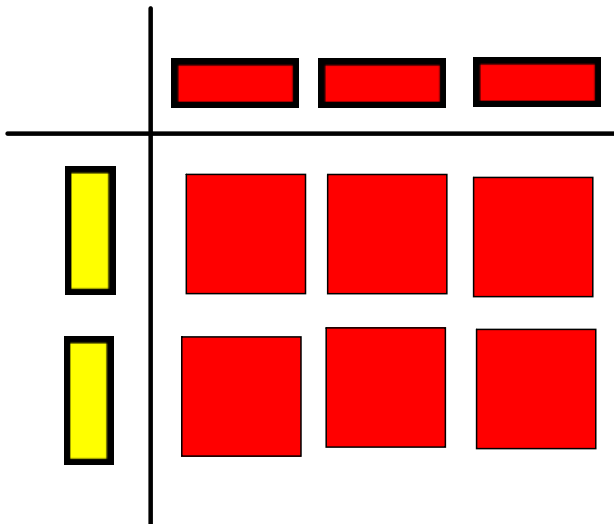


Section 5.6: Multiplying & Dividing Polynomials by Monomials

Multiplication:

Method #1: To help model multiplying polynomials by a monomial, we use guiding tiles.

Ex #1: Determine the product: $(2x)(-3x)$

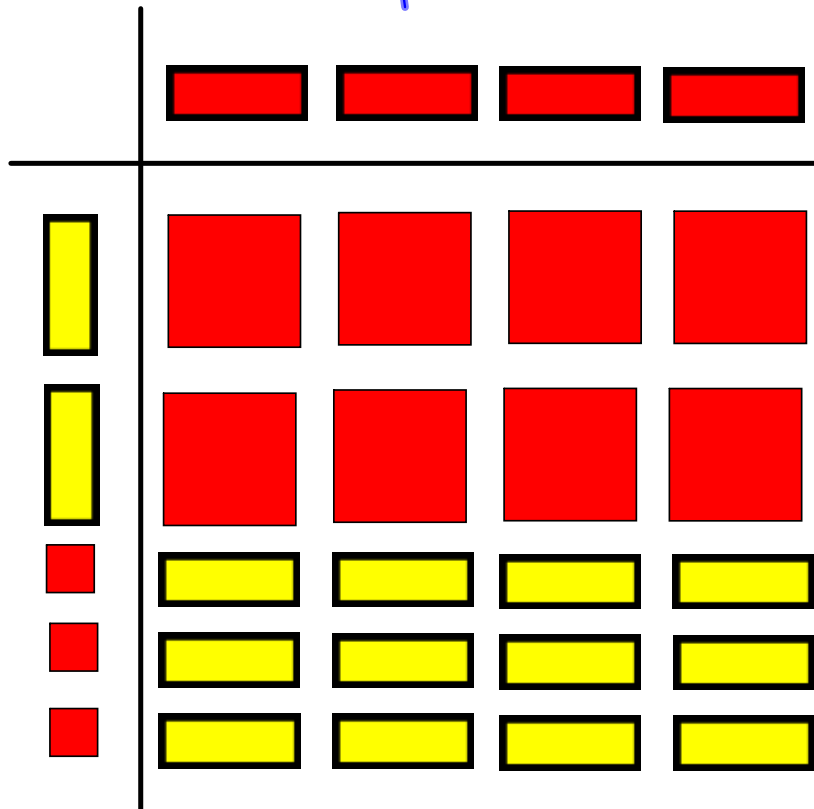


NOTE: If the guiding tiles are the same color, the tiles in the product are yellow. If the tiles are different, the tiles in the product are red.

Ans) $-6x^2$

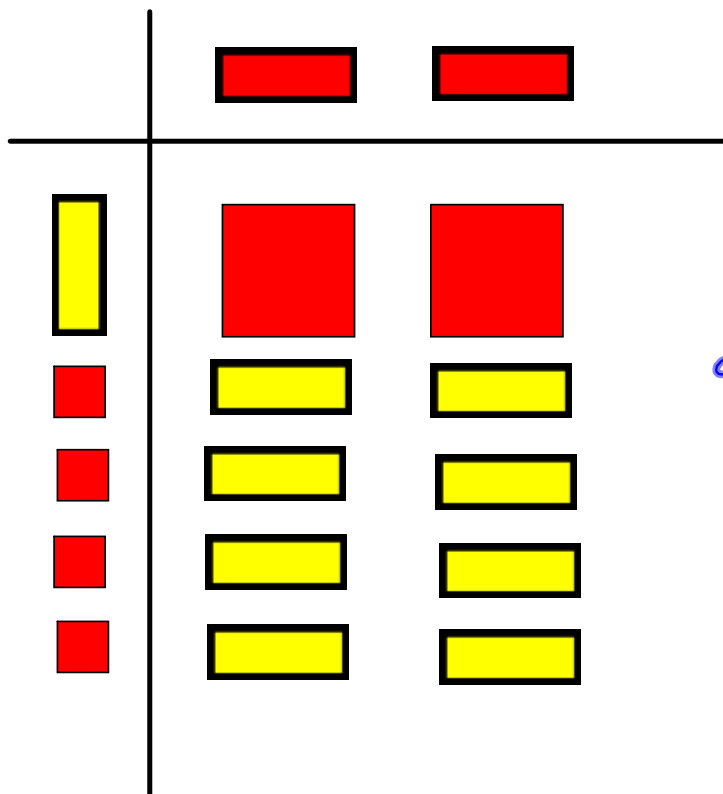
Ex#2: Determine the product: $-4c(2c-3)$

Ans)



$-8c^2 + 12c$

Ex #3: Multiply the following: $(-2x)(x-4)$



$\therefore -2x^2 + 8x$

Method 2: Multiplying without Tiles:

Apply the Distributive Property.

Ex#1: Multiply: $3y(2y^2 - 4y + 10)$

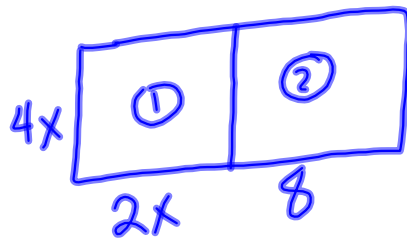
$$\begin{aligned} \text{Ans)} \quad & (3y)(2y^2) + (3y)(-4y) + (3y)(10) \\ & = 6y^3 - 12y^2 + 30y \end{aligned}$$

Ex#2: Find the product of:
 $-4w(2w^4 - 3w^2 + 11)$

(Ans) $(-4w)(2w^4) + (-4w)(-3w^2) + (-4w)(11)$
 $= -8w^5 + 12w^3 - 44w$

Method#3: Area Model: Break up our poly nomial
 Using a rectangle:

(ex) Find the product: $4x(2x+8)$



Ans) $A = A_1 + A_2$ $A_1 = l \times w = (2x)(4x)$
 $= 8x^2$

$A_2 = l \times w = (8)(4x)$
 $= 32x$

∴ $A = 8x^2 + 32x$

Dividing Polynomials by a Monomial

Method #1: With Tiles

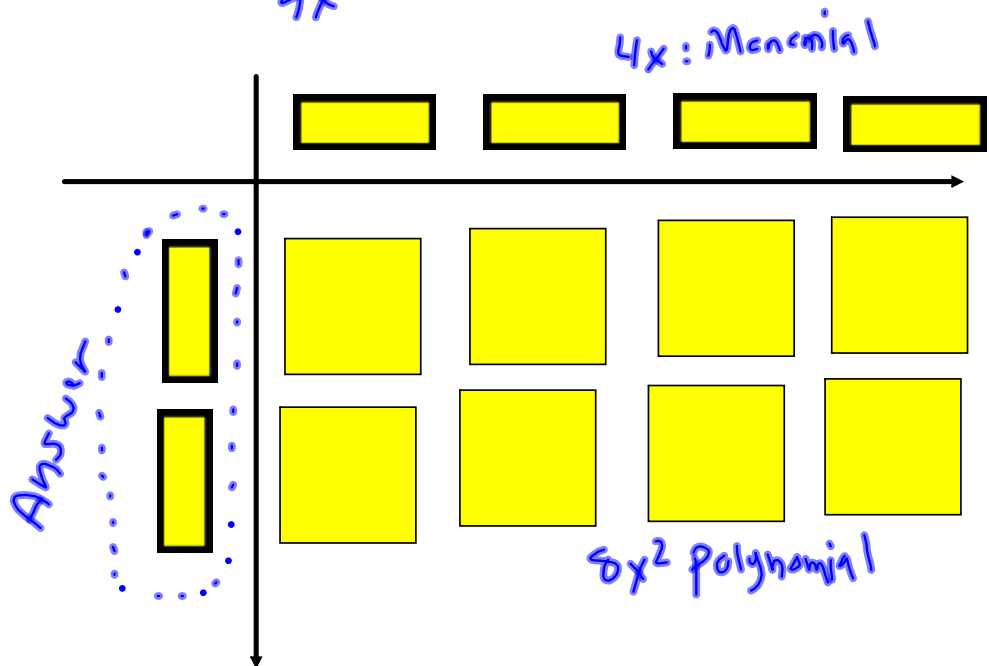
Numerator \rightarrow Polynomial to model inside the table.

Denominator \rightarrow Monomial to model as one set of guiding tiles.

(Ex#1) Determine the quotient of the following:

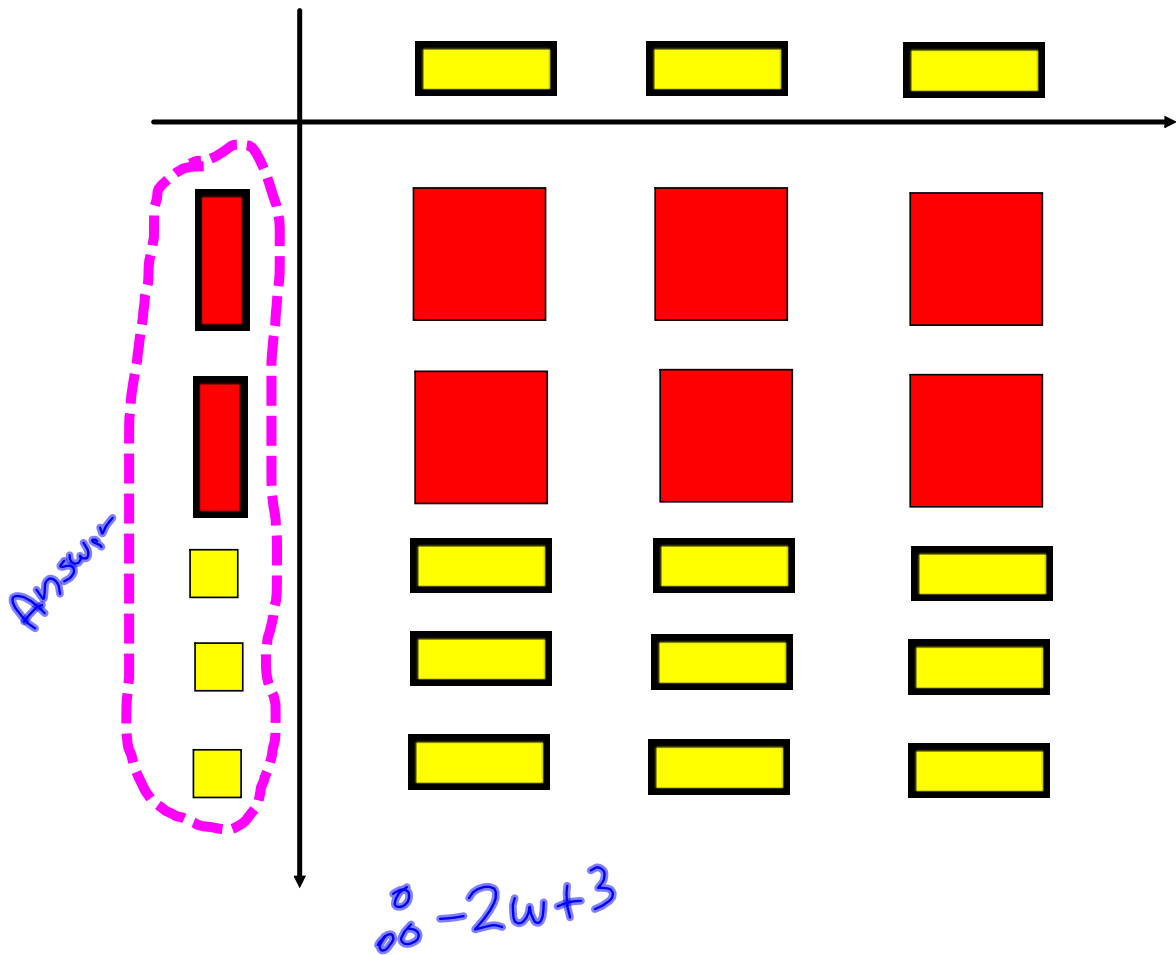
(A)
$$\frac{8x^2}{4x}$$

(Ans)



(B) Divide : $(-6w^2 + 9w) \div 3w$

(Ans)
$$\frac{-6w^2 + 9w}{3w}$$



Method 2: Dividing Without Tiles:

Determine the quotient of each:

$$(A) \frac{12x^2 - 15x}{-3x}$$

$$\text{Ans) } \frac{12x^2}{-3x} + \frac{-15x}{-3x} = -4x + 5$$

$$(B) \quad \frac{24x^6 - 18x^5 + 12x^4 - 36x^3 + 60x^2}{6x}$$

$$\text{Ans)} \quad \frac{24x^6}{6x} + \frac{-18x^5}{6x} + \frac{12x^4}{6x} + \frac{-36x^3}{6x} + \frac{60x^2}{6x}$$

$$= 4x^5 - 3x^4 + 2x^3 - 6x^2 + 10x$$

Questions:

p255 - p257

4, 6, 7, 12, 16, 19