Try these:

$(3x)(2x - 6y + 2z)$

$$\dfrac{36pq + 45q - 81q^2}{9q}$$

$(30m - 15a + 9t - 54h) \div (-3)$

$-4z(6z^2 - 9)$

$(11y^3 - 8y^2 + 10y)(5y^3)$

$(49t^8 - 7t^5) \div (7t^3)$

Try these:

$(3x)(2x - 6y + 2z)$

$6x^2 - 18xy + 6xz$

or

$(3x)(2x) \ (+3x)(-6y) \ (+3x)(2z)$

$6x^2 - 18xy \ + 6xz$

$$\frac{36pq + 45q - 81q^2}{9q}$$

$\dfrac{36pq}{9q} + \dfrac{45q}{9q} - \dfrac{81q^2}{9q}$

$4p + 5 \ - 9q$

$(30m - 15a + 9t - 54h) \cancel{\;\;\;}$

$\dfrac{}{-3} \quad \dfrac{}{-3} \quad \dfrac{}{-3} \quad \dfrac{}{-3}$

$= -10m + 5a - 3t + 18h$

$-4z(6z^2 - 9)$

$-24z^3 + 36z$

$(11y^3 - 8y^2 + 10y)(5y^3)$

$55y^6 - 40y^5 + 50y^4$

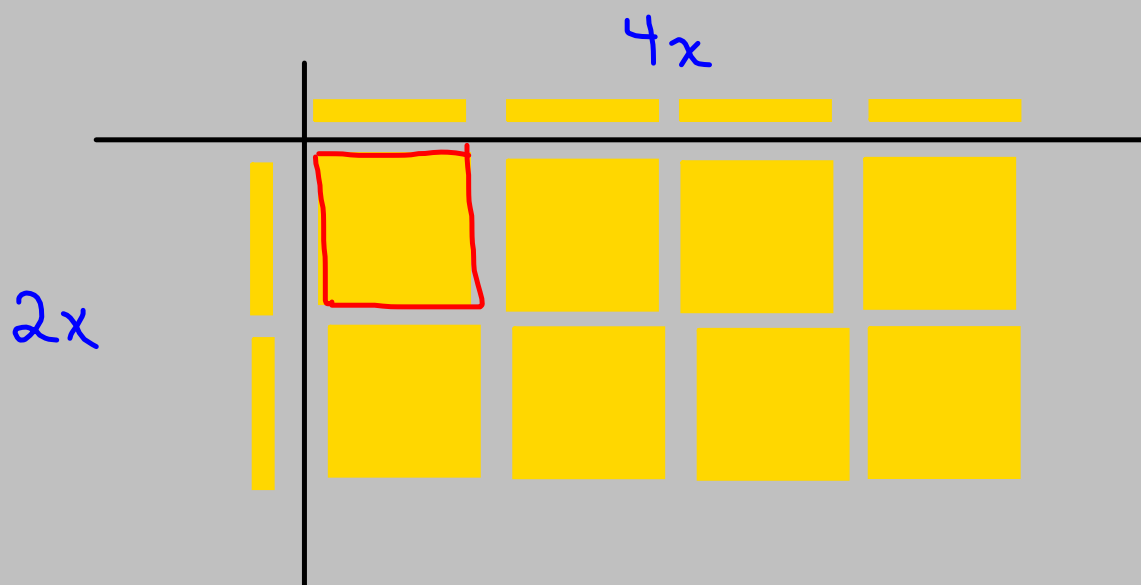$(49t^8 - 7t^5) \div \cancel{(7t^3)}$

$\dfrac{}{7t^3} \quad \dfrac{}{7t^3}$

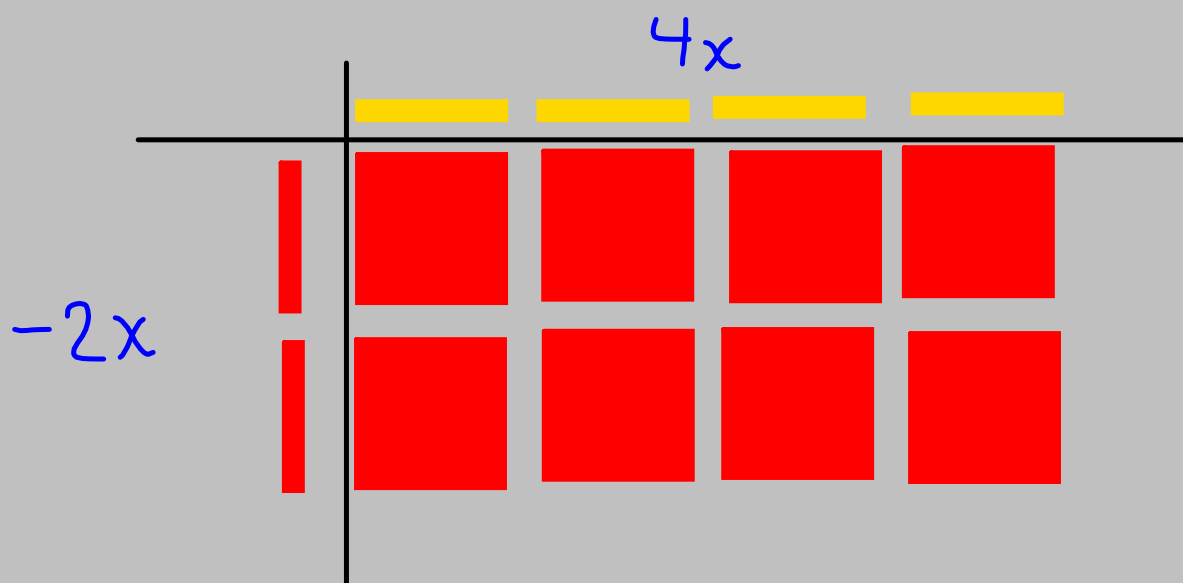$7t^5 - 1t^2$

Algebra Tiles

Multiplication

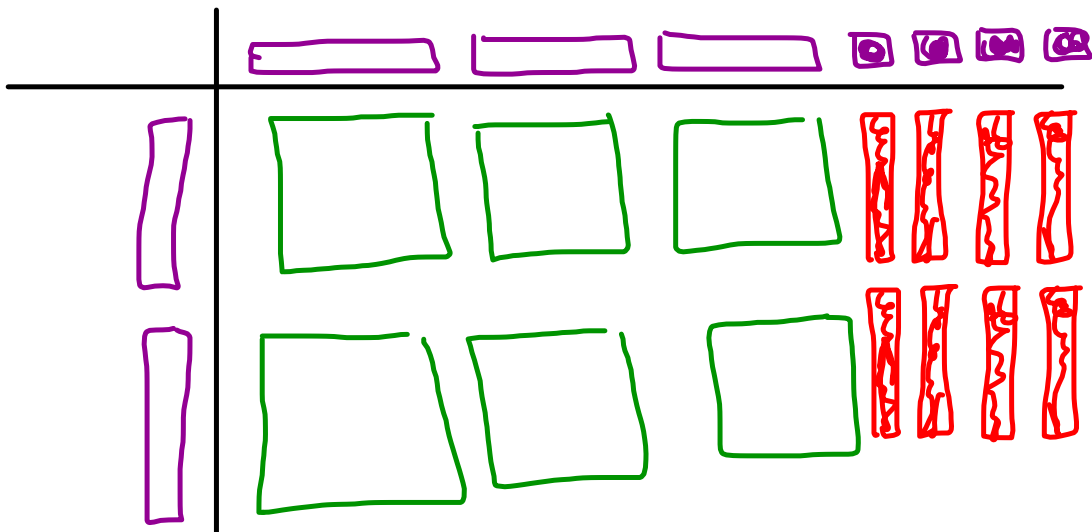$$(2x)(4x) = 8x^2$$

Algebra Tiles

Multiplication

$$(-2x)(4x) = -8x^2$$

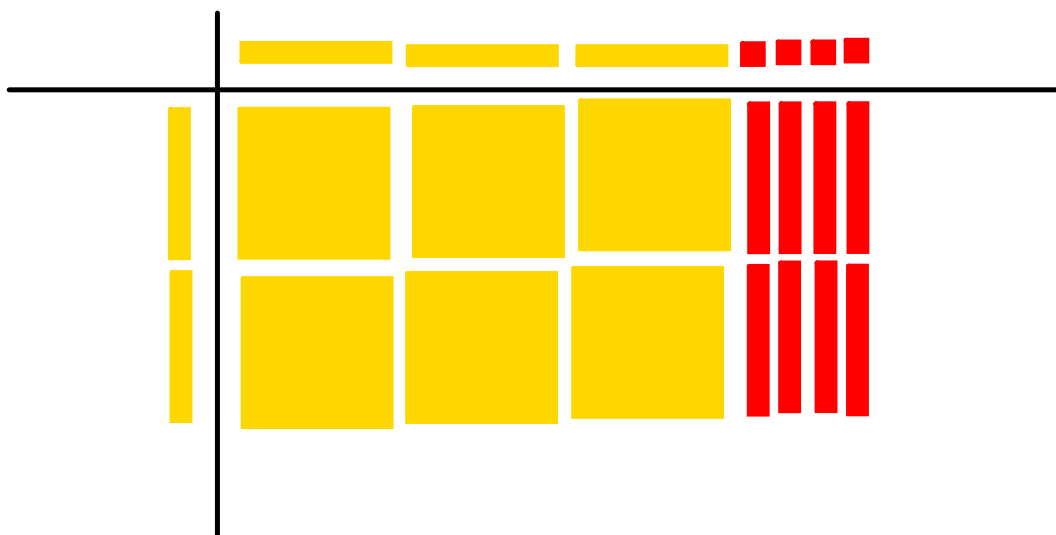# Algebra Tiles

Determine the product of each

$$(2x)(3x - 4) = 6x^2 - 8x$$
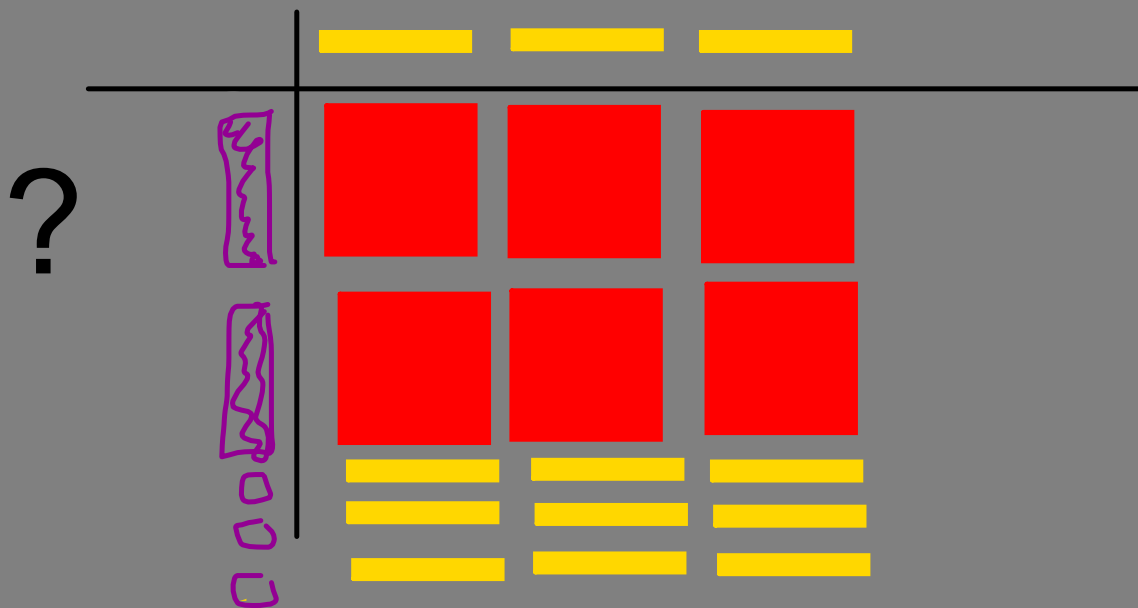
Algebra Tiles

Determine the product of each

(2x) (3x - 4)

Algebra Tiles

Division $\dfrac{(-6x^2 + 9x)}{(3x)} = -2x + 3$

?

MATH 9 SKILLS CHECKLIST   **NAME:**_____

UNIT 4 – POLYNOMIALS

M. Burns

GENERAL CURRICULUM OUTCOME (GCO):   **Patterns and Relations (PR) – Represent algebraic expressions in multiple ways.**

SPECIFIC CURRICULUM OUTCOMES (SCOs):   **PR5, PR6 and PR7**

_____ 1.   **(PR5) Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2).**

    ACHIEVEMENT INDICATORS:

_____ ✓   **Create a concrete model or a pictorial representation for a given polynomial expression.**

     Ex.:   Model $3x^2 + 4$ using algebra tiles.   **MODEL:** ☐ ☐ ☐ ⊞

_____   **Write the expression for a given model of a polynomial.**

     Ex.:   Identify the polynomial represented by the following collection of algebra tiles: ■ ■ ■

     ANSWER: $-3x^2$

_____   **Identify the variables, degree, number of terms and coefficients, including the constant term, of a given simplified polynomial expression.**

     Ex.: $4m^2 - n - 7$

VARIABLES:	m and n	NUMERICAL COEFFICIENTS:	4 and -1
DEGREE:	2	CONSTANT TERM:	-7
NUMBER OF TERMS:	3		

_____   **Describe a situation for a given first degree polynomial expression.**

     Ex.:   Let "x" represent the height of a student.

     Ex.:   Let "2a" represent the length of one side in an equilateral triangle.

_____   **Match equivalent polynomial expressions given in simplified form.**

     Ex.: $4x - 3x^2 + 2$ is equivalent to $-3x^2 + 4x + 2$

_____ 2.   **(PR6) Model, record and explain the operations of addition and subtraction of polynomial expressions concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2).**

ACHIEVEMENT INDICATORS:

_____ **Identify like and unlike terms.**

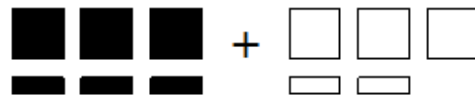Ex.:   From the list, which terms are "like" $8x^2$?

$-3x$; $5x^2$; 4 ; $3x$; 9 ; $-11x^2$; $7x$; -3

ANSWERS: $5x^2$ and $-11x^2$

_____ **Model addition of two given polynomial expressions concretely or pictorially and record the process symbolically.**

Ex.:   Use algebra tiles to model the sum of the binomials below then record your answer symbolically.

$(-3x^2 - 3x) + (3x^2 + 2x)$:

$=$ $-3x^2 + 3x^2 - 3x + 2x$
$=$ $-x$

_____ **Apply a personal strategy for addition and subtraction of given polynomial expressions and record the process symbolically.**

Ex.: $(-2a^2 + a - 1) - (a^2 - 3a + 5)$

$=$ $(-2a^2 + a - 1) + (-a^2 + 3a - 5)$ (ADD the OPPOSITE of each term in the 2ⁿᵈ polynomial.)
$=$ $-2a^2 + a - 1 - a^2 + 3a - 5$
$=$ $-2a^2 - a^2 + a + 3a - 1 - 5$
$=$ $-3a^2 + 4a - 6$

_____ **Identify the error(s) in a given simplification of a given polynomial expression.**

Ex.:   A student incorrectly subtracted $(2x^2 + 5x + 10) - (x^2 - 3)$ like this:

        $(2x^2 + 5x + 10) - (x^2 - 3)$
$=$ $2x^2 + 5x + 10 - x^2 - 3$
$=$ $x^2 + 2x + 10$

Identify the errors and correct them.

    ANSWER: The student forgot to add the opposite of the second polynomial, then grouped unlike terms ($5x$ and -3). They should have done the following:

        $(2x^2 + 5x + 10) - (x^2 - 3)$
$=$ $(2x^2 + 5x + 10) + (-x^2 + 3)$
$=$ $2x^2 + 5x + 10 - x^2 + 3$
$=$ $x^2 + 5x + 13$

3.   **(PR7) Model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials concretely, pictorially and symbolically.**

ACHIEVEMENT INDICATORS:

_____ **Apply a personal strategy for multiplication and division of a given polynomial expression by a given monomial.**

Ex.: $2x(-3x + 5)$ Ex.: $\underline{24d^2 - 12d}$
      $=$ $-6x^2 + 10x$ $-12d$

                                                    $=$ $-2d + 1$

_____ **Provide examples of equivalent polynomial expressions.**

Ex.:   Are $5j^2 + 20$ and $5(j^2 + 4)$ equivalent expressions?

        ANSWER: Yes, these are equivalent expressions because $5(j^2 + 4) = 5j^2 + 20$.

_____ **Identify the error(s) in a given simplification of a given polynomial expression.**

Ex.:   A student incorrectly multiplied $-3d(-2d + 9)$ like this:

                $-3d(-2d + 9)$
      $=$ $6d - 27$

Identify and correct the errors.

        ANSWER: The student did not multiply the variables in their work. They should have done the following:

                $-3d(-2d + 9)$
      $=$ $6d^2 - 27d$

VOCABULARY:

_____ variable	_____ polynomial	_____ equivalent polynomials
_____ expression	_____ monomial	_____ like terms
_____ term	_____ binomial	_____ unlike terms
_____ constant term	_____ trinomial	_____ algebra tiles
_____ (numerical) coefficient	_____ degree	

Class/Homework

Pg 259 - 261
- #2
- #6
- #9
- #10
- #11
- #12 a, d
- #15 a, e, g,h
- #16
- #19 b
- #22 a,c,h,k,l
- #24 a
- #26 a,c,e,g
- #28 b, d, f
- #29 a, b

Check Answers in back of textbook

Pg 262
Questions 1 to 8