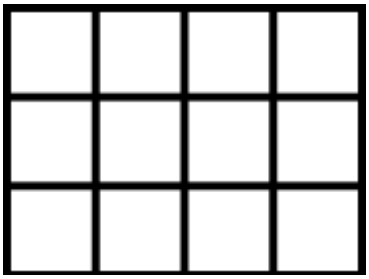
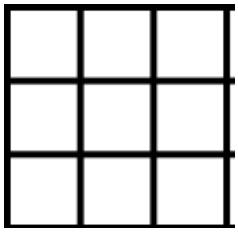
4.3 MULTIPLYING & DIVIDING MONOMIALS

Name:_____ Block_____

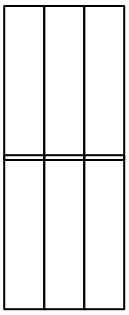
Review: What is a monomial?

Determine the ***area of each rectangle***.

a) 

b) 

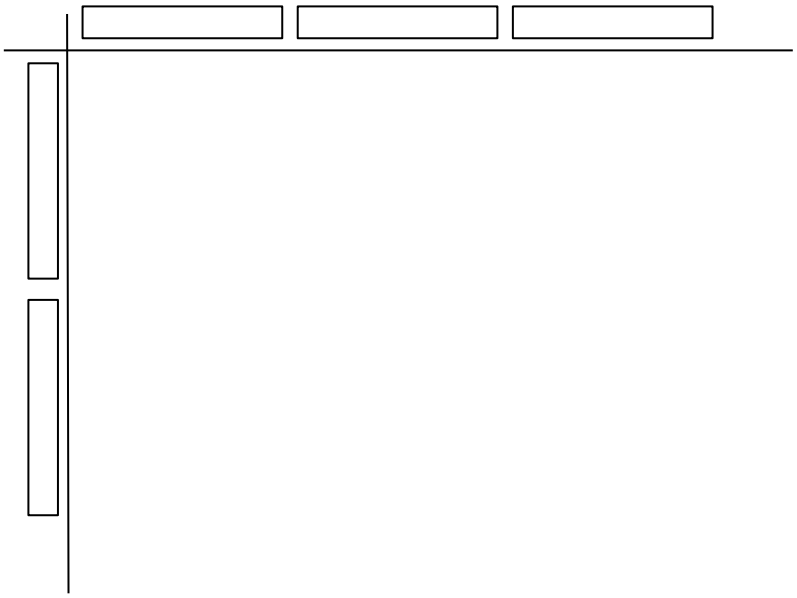
Consider the rectangle formed by the ***algebra tiles*** below.



a) What is the area?

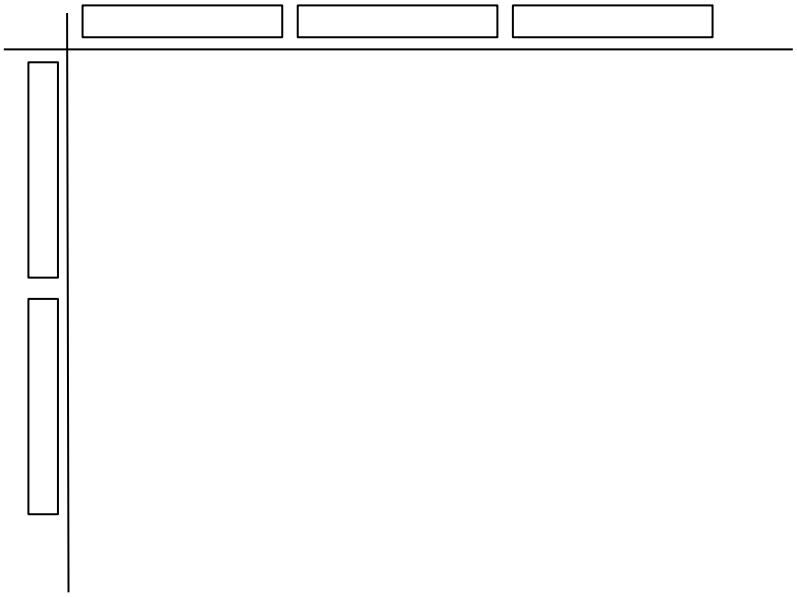
Multiplying Monomials

Use algebra tiles to represent the **monomial product (3x)(2x)**



Algebraically:

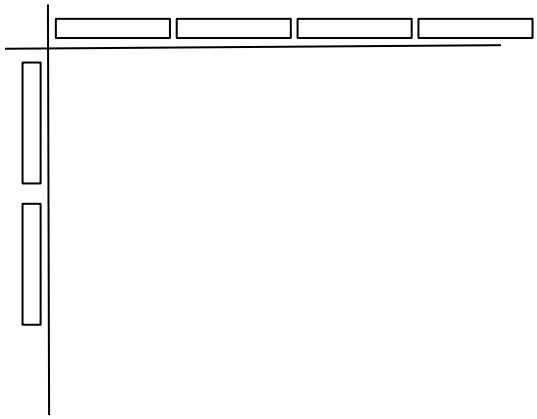
Use algebra tiles to represent the **monomial product (3x)*(-2x)***



Algebraically:

Example #1: Multiply (4x)(2x)

a)

Method #1: Algebra Tiles	**Method #2: Solve Algebraically**
	

Example #2: Multiply.

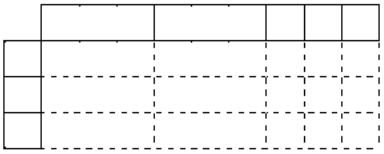
a) (5x)(4y)

b) (-6m)(5m)

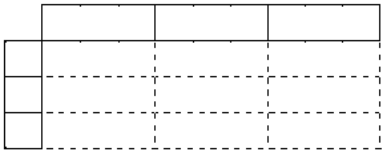
c) $(\frac{1}{2}x)$ (3x)

PRACTICE

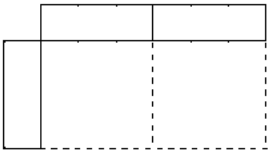
318. $3(2x+3) =$



319. $3(3x) =$



320. $x(2x) =$



Multiply two monomials.

337. $2(5x)$

338. $-3(2x)$

339. $8y(2x)$

340. $-2x(-9y)$

Correct any errors if applicable.

341. $-1.9x(-2x)$

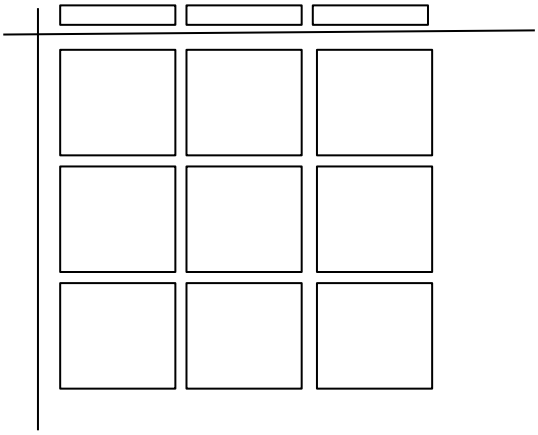
$-3.8x^2$

342. $3xy(-2x)$

Dividing Monomials

Example #1:

Divide the pair of monomials: **$9x^2 \div 3x$**

Method #1: Algebra Tiles	**Method #2: Algebraically**
	

Example #2:

Divide each pair of monomials.

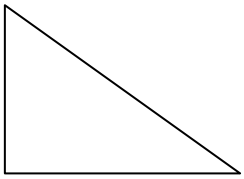
a) $(6x^2) \div (-2x)$

b) $\frac{10xy}{5y}$

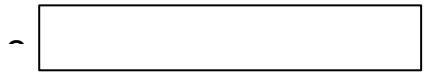
c) $\frac{-12xy}{-3x}$

Example #3:

a) Determine an expression for the area in the figure below:

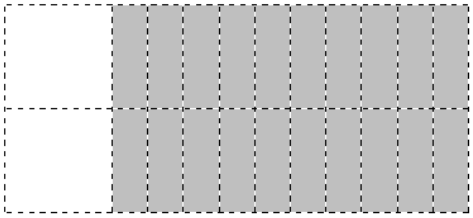


b) What is the length of the missing side in the figure below?

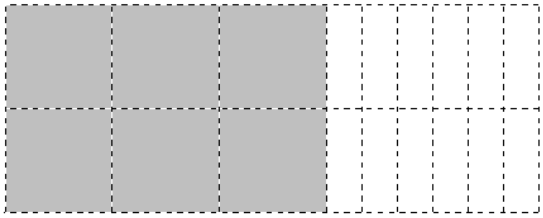


Use algebra tiles to simplify the polynomial.

369. Use the tiles to show $\frac{2x^2 - 20x}{2x} =$



370. Use the tiles to show $\frac{-6x^2 + 12x}{-3x + 6} =$



Simplify or write "AR"(already reduced).

371. $-\frac{35x^2}{5}$	372. $\frac{14x^2}{x}$	373. $\frac{-34x}{7}$
374. $\frac{55x^2}{-11x}$	375. $\frac{4x^2z}{xz}$	376. $\frac{24y^2z}{-4y^2z}$

ASSIGNMENT #3

Section 4.3 pg 132-135

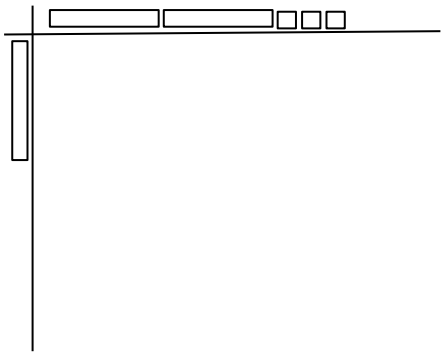
Required questions	Extra practice	Extension
2-4, 6-7, 11, 12, 13abcd, 14, 16-17	5, 8, 9, 13ef, 15	10, 18, 22, 23

4.4 MULTIPLYING POLYNOMIALS BY MONOMIALS

Name:_____ Block_____

Example #1: Determine each product.

a) $x(2x + 3)$

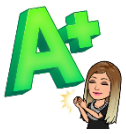
Method #1: Algebra Tiles	**Method #2: Algebraically**
	

b) $-3(2x^2 - 2x + 1)$

Method #1: Algebra Tiles	**Method #2: Algebraically**

The symbolic/algebraic process is called the **"DISTRIBUTIVE PROPERTY":**

OR…the Distributive Law: https://www.youtube.com/watch?v=0v-G6OwcKmU



When multiplying a monomial by a polynomial, multiply the monomial by _____ _____ in the polynomial.

Example #2:

Calculate each product.

a) $5(4m + 2)$

b) $-3x(5x^2 + 4x - 5)$

c) $8x(2y - 3x)$

Often questions will require that **you first use the distributive property**, we often call this:

① **expanding**, and then …
② **simplifying**.

Example #3:
Expand and simplify.

a) $3(6x^2 - 2x - 1) - 4(2x^2 - 3x + 5)$

Expand using the distributive property

Make sure you also distribute the negative sign when expanding an expression

Collect like terms

Combine like terms

b) $5k(k + 7) - (k^2 + 4)$

c) $\frac{1}{3}(6w + 9) - \frac{3}{4}(8w - 12)$

PRACTICE

Multiply a binomial or a trinomial by a monomial.

346. $-2(-3x+1)$

Possible solution strategy:
-2 (-3x+1)
Distribute
=-2(-3x)+(-2)(1)
=6x-2

347. $-5(2x-4)$

348. $2y(7x-6)$

349. $-4(-9x+3)$

Correct any errors if applicable.

350. $-8x(x-3)$

$-8x^2-24x$

351. $3x(7x-2y)$

352. $7x\left(5x+\frac{4y}{7}-3\right)$

353. $\frac{1}{2}x(16x-4y-z)$

Correct any errors if applicable.

354. $-2x(-4x+2-11z)$

$8x^2+4x+22z$

1) $8(2d^2 + 7dg + 9g^2)$

2) $7q(8q + 5y)$

6) $6k(9k^2 - 2kq + 7q^2)$

7) $4q(2q^2 - 6qp - 8p^2)$

Homework

ASSIGNMENT #4
Section 4.4 pg 139-141

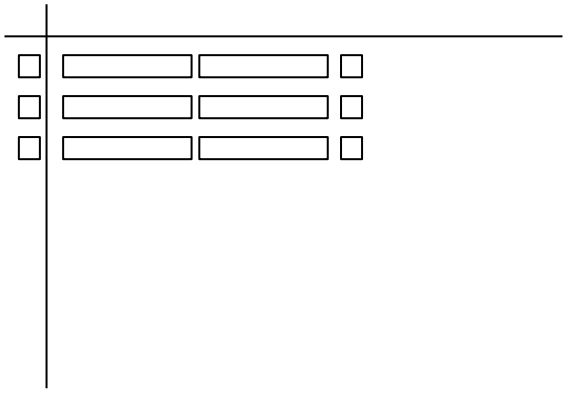
Required questions	Extra practice	Extension
1, 2, 3, 4abcd, 6abcd, 8abcd, 9abcde, 10, 11abcd, 12, 13, 16, 17, 18abcd, 19a	4ef, 5, 6ef, 7, 8ef, 9fg, 11ef, 14, 15, 18ef, 20	21, 22

QUIZ ON 4.3-4.4 NEXT LESSON

4.5 Dividing Polynomials by Monomials

Name:_____ Block_____

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

Method #1: Algebra Tiles	Method #2: Algebraically
	

Example #2

a) $\frac{30k^2-18k}{-6k}$

b) $\frac{-6x^2+9x}{3x}$

c) $\frac{15x-10}{5}$

d) $\frac{14m^2+8m}{-2m}$

PRACTICE

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

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

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

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

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

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 $\mathbf{x^2 + 6x}$, and the *length is 3x.*

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

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

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

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

CHAPTER REVIEW & PRACTICE TEST

① COMPLETE CHAPTER 4 REVIEW

Homework	Required questions	Extra practice	Extension
CHAPTER REVIEW pg 151-153	1, 2abc, 3, 4a, 5aceg, 7, 8aceg, 9, 10, 11aceg, 12, 14ace, 15, 16ab, 17	2def, 4b, 5bdfh, 6, 8bdfh, 11bdfh, 13, 14bdf, 16cd,	

② OPTIONAL EXTRA PRACTICE TEST *(YOU DON'T HAVE TO DO...BUT IF YOU HAVE TIME, IT'S GOOD PRACTICE!)*

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. Combine like terms.
$10x^2 - 6x + 2x - 8x^2$

a. $2x^2 - 4x$ b. $-2x^2$ c. $4x^2 - 6x$ d. $2x^2 + 4x$

____ 2. Combine like terms. $2x^2 - 5 - 6x - 8x^2 + 7$

a. $-6x^2 - 6x + 2$ c. $6x^2 - 6x + 2$
b. $6x^2 - 6x - 2$ d. $-6x^2 - 6x - 2$

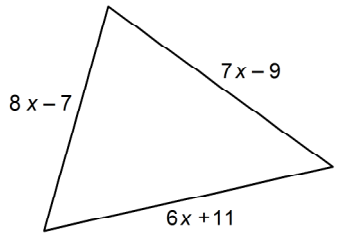
____ 3. Add: $(8x - 7) + (-6x - 2)$

a. $2x - 5$ b. $2x - 9$ c. $14x - 9$ d. $2x + 5$

____ 4. Add: $(3x^2 - 6) + (6x^2 - 9x - 7)$

a. $18x^2 - 9x - 42$ c. $9x^2 - 9x - 13$
b. $9x^2 - 9x + 13$ d. $9x^2 - 15x - 7$

____ 5. Write the perimeter of this triangle as a polynomial in simplest form.



a. $21x - 27$ b. $21x + 5$ c. $21x - 5$ d. $21x + 27$

____ 6. Subtract: $(6x - 3) - (11x - 12)$

a. $-5x - 15$ b. $-5x - 9$ c. $-5x + 9$ d. $-5x + 15$

____ 7. Subtract: $(2p - 5) - (5 - 2p)$

a. $4p + 10$ b. $4p - 10$ c. $-4p + 10$ d. 0

____ 8. Subtract: $(2r^2 - 4) - (5r^2 + 6r + 8)$

a. $-3r^2 - 6r - 12$
c. $-3r^2 + 6r + 4$
b. $3r^2 - 6r - 12$
d. $3r^2 + 6r + 4$

____ 9. Subtract: $(3 - 2c - 9c^2) - (5c - 3)$

a. $-9c^2 - 7c + 6$
c. $9c^2 + 7c - 6$
b. $-9c^2 - 7c$
d. $-9c^2 + 7c - 6$

____ 10. Multiply: $8(5x^2 - 2x)$

a. $40x^2 + 6x$
b. $40x^2 - 16x$
c. $13x^2 - 6x$
d. $40x^2 - 2x$

____ 11. Divide: $\frac{30p - 42}{6}$

a. $30p - 36$
b. $5p - 42$
c. $5p - 7$
d. $24p - 36$

____ 12. Multiply: $(-2)(4c^2 - 6c - 7)$

a. $-8c^2 - 12c - 14$
c. $2c^2 - 8c - 9$
b. $-8c^2 + 12c + 14$
d. $-8c^2 - 6c - 7$

____ 13. Divide: $\frac{-12y^2 - 6y - 9}{-3}$

a. $-15y^2 - 9y - 12$
c. $4y^2 - 6y - 9$
b. $4y^2 + 2y + 3$
d. $-4y^2 - 2y - 3$

____ 14. Multiply: $(-4w)(6w)$

a. $-24w^2$
b. $-10w^2$
c. $2w^2$
d. $24w^2$

____ 15. Divide: $\frac{-12x^2}{3x^2}$

a. $-9x$
b. -4
c. -9
d. $-4x$

____ 16. Multiply: $-6c(4c - 5)$

a. $-24c^2 - 30c$
b. $-24c^2 + 30c$
c. $-24c^2 - 5$
d. $-2c^2 + 11$

____ 17. Divide: $\frac{-10p^2 - 8p}{-2p}$

a. $5p + 4$
b. $20p^2 - 16$
c. $5p^2 - 8p$
d. $5p + 4p$

____ 18. Divide: $(6x^2 - 4x^2) \div 2x$

a. $3x - 2$
b. $4x - 2$
c. $3x - 2x$
d. $3x - 4x^2$

____ 19. Multiply: $(-q)(8p - 5q)$

a. $8p + 6q$
b. $-8pq + 5q^2$
c. $7pq - 6q^2$
d. $-8pq - 5q$

Short Answer

20. Combine like terms.
$2x^2 - 6x + 5x^2 + 2x - 6$

21. Simplify: $-4x^2 + 2 - 8x + 4 - 3x^2 + 3x$

22. Group like terms, then simplify.
$4 + 5x - 8 + 4x^2 + 2x - 4x^2 + 5 - 7x$

23. Add: $(5p^2 + 4q^2 - pq) + (6pq - 8q^2 + 2p^2)$

24. Subtract: $(-5x - 8) - (-7x - 2)$

25. Subtract: $(9x^2 - 6x + 5) - (5x^2 - 2x - 5)$

26. Subtract: $(5y^2 - 2x^2 + 6x - 10) - (2y^2 - 6x^2 - 10x - 9)$

27. Multiply: $11(-6x^2 - 4)$

28. Divide: $\dfrac{9m - 15m^2}{-3m}$

29. Determine the product: $(-2x)(3x + 6y - 6z)$

Problem

30. Add. $(4x^2 - 5y^2 + xy) + (8y^2 - 6xy - 8x^2)$

31. Subtract: $(9x^2 + 6x) + (3x + 7) - (3x^2 - 5x - 11)$
Show your work.

32. Simplify: $(6 - 5y + 3z)(-2x) + (6x^2 - 8x^2y - 12x^2z) \div 2x$.

33. a) Determine a polynomial for the perimeter of the shape below.
b) Determine a polynomial for the area of the shape below.
c) Determine the perimeter and area when x = 7 cm.