

Exam Review
Day 4:
Chapter 5 (Polynomials)

Polynomials



A **polynomial** is one term or the sum of terms whose variables have whole number exponents

$$5x^2 + 1$$



Warm Up

Copy warm-ups into your notebooks



1) Classify the following polynomials as either monomials, binomial or trinomials

_____ $9x^2y$

$v + 2t$ _____

_____ 11

n _____

_____ $k - 7 + b$

$3 + g^{10}$ _____

2) What is the degree of the following polynomial? _____

$$8x^5 - 6 + 10x - 9x^{15} + 10x^{14}$$

3) Rewrite the above in descending order

_____ $- 15$



Terms with polynomials

Remember:

Monomial: one term

Binomial: two terms

Trinomials: three terms

Variables: Letters

Coefficients: Numbers out in front of letters

Constant: the number all by itself

Degree: the highest exponent on a variable

$$5x^3 + 7x^8 - 3x + 3x^2 + 9$$

This polynomial has a degree of _____, because the largest exponent is _____.

.....

The term "+9" has a degree of _____, because there is no variable with it. It is called a "constant", because this term will never change in value.



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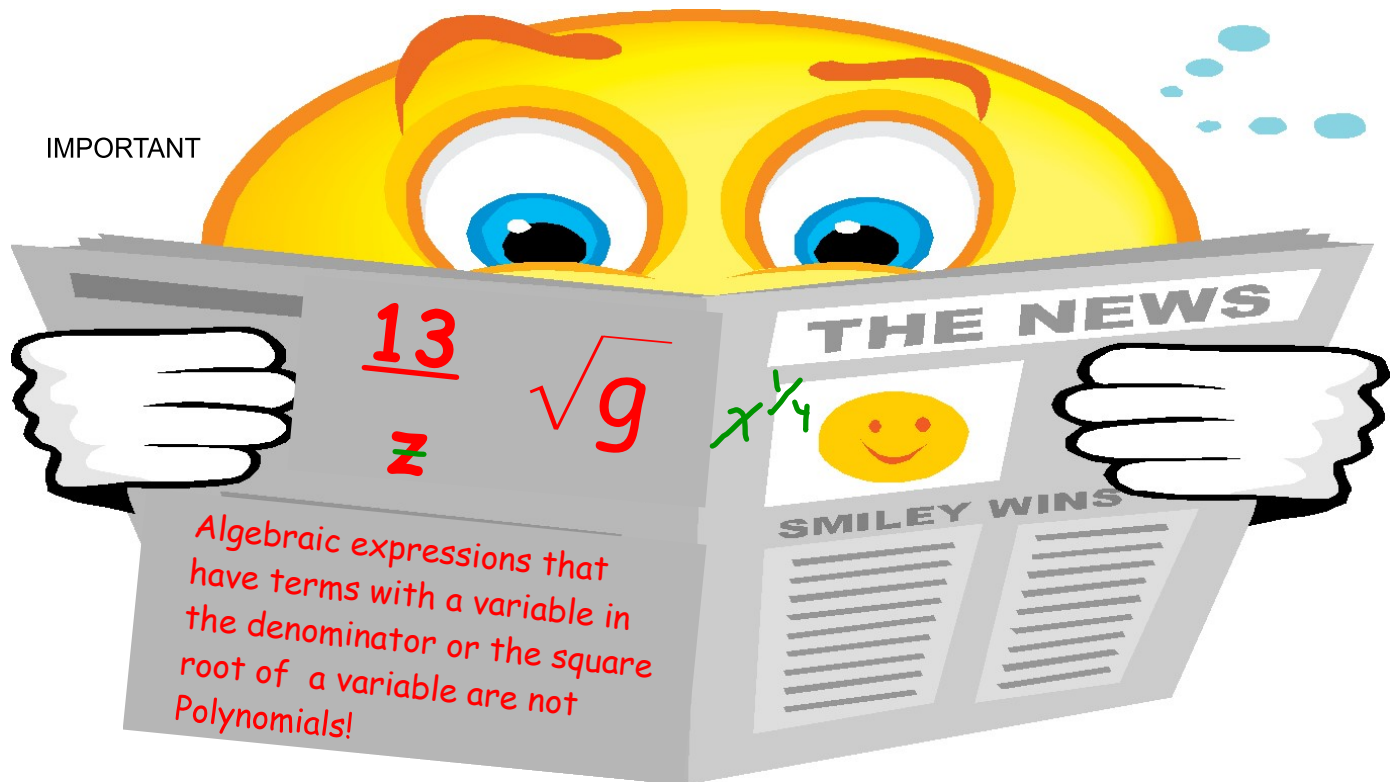
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will be written as...





Which are polynomials?

1) \sqrt{x}

2) $\frac{3}{4}y$

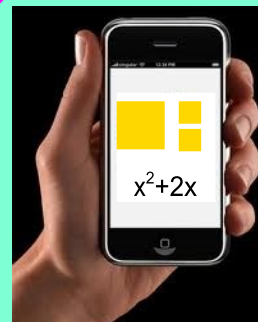
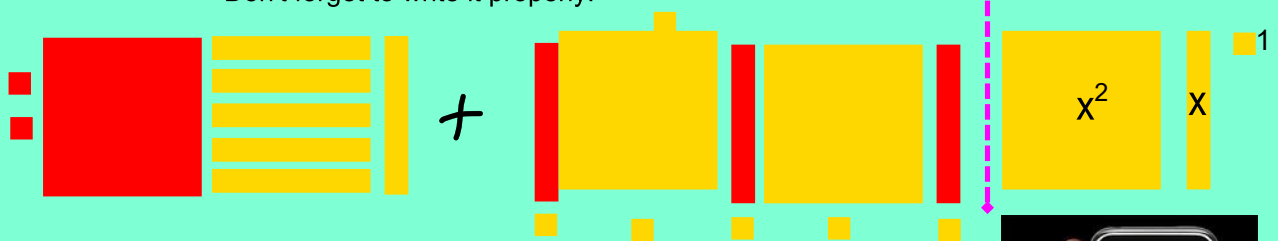
3) $x^2 + 1$

4) $\frac{3}{t}$

Modelling Polynomials

Write the algebraic expression that represents each model.

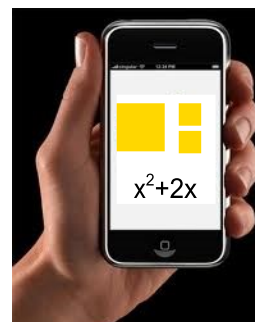
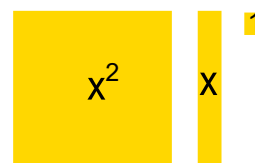
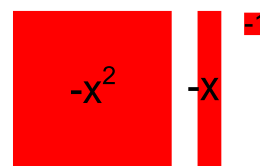
Don't forget to write it properly!

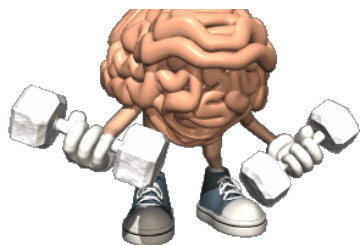


$$-5x^2 + 2x - 3$$

Modelling Polynomials

$$x^2 - x + 1$$





Warm Up
Copy warm-ups into your notebooks

1) Classify the following polynomials as either monomials, binomial, trinomial or none.

$$3x^2 + 6y$$



$$\frac{4x^7}{z}$$

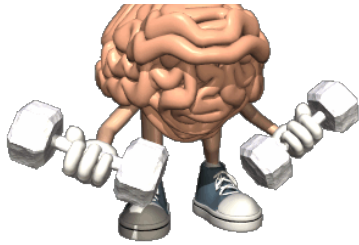
$$9x$$

$$2x^2 - 5x - 1$$

2) What is the degree of the following polynomial? _____

$$13x^7 - 11x^{12} + 8x^9 - 9x^{11} - 5$$

3) Rewrite the above in descending order



4) Fill in the following

a) $-4x^6 - 7x^4 + 12$

Variables:

Coefficients:

Constants:

b) $5x^2 + 6y$

Variables:

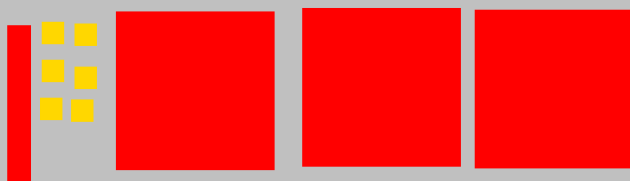
Coefficients:

Constants:

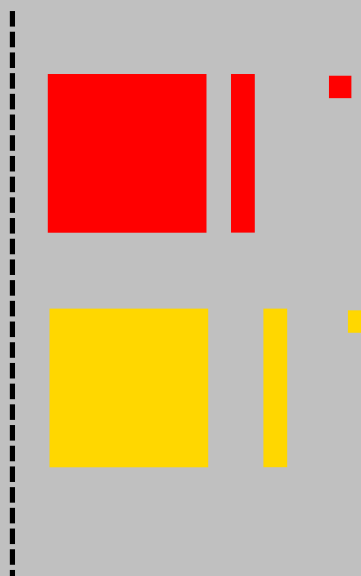
Warm Up



5) Write the polynomial for the following algebra tiles.



6) Model the following Polynomial
 $-5x + 2x^2 - 9$

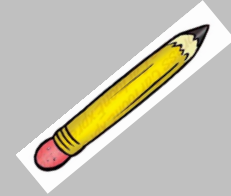


TILES

Like Terms:

are algebra tiles with the same shape and size (Don't worry about colour → signs)

Here is a collection of tiles, lets group them together into "like terms".



Always collect like terms

Once you collected like terms you have to simplify the tiles

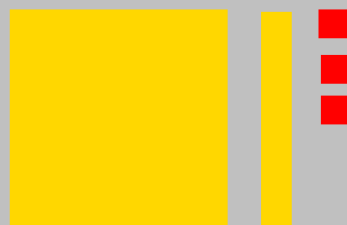
HOW????

Remove the "zero pairs"

..

:

Copy what is left over



See see it from the on line textbook

$$|x^2 + |x - 3$$



Polynomial Expressions



Like terms are $-3x^2$ and $4x^2$
(same letter with the same numerical exponent)

Unlike Terms are $-x^2$ and x or $are y^2$ and t^2
(either different letters and/or different numerical exponent)

Simplified Form

- *fewest algebra tiles possible
- *contains only one term of each degree and no terms with a zero coefficient



Always simplify any polynomial by grouping like terms.

Simplify the following polynomial

Example: $(-3x + 2x^2 - 7) + (10x + 5) - 4x^2$

Step 1) Group like terms

Always start with the largest exponent

$$\begin{array}{r} 2x^2 - 4x^2 \quad -3x + 10x \quad -7 + 5 \\ \hline -2x^2 \quad + 7x \quad - 2 \end{array}$$

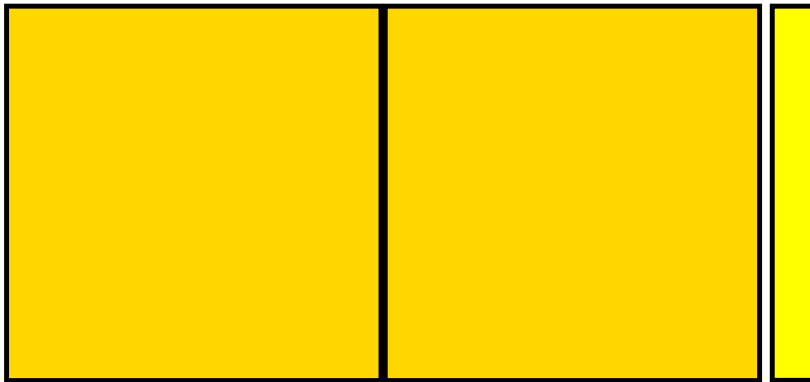
Ex) $3 + 4y + y + 7$

Ex) $4x^2 + 4x^3 + 2x^2$

Perimeter - is the distance around an object
- to calculate you add the length of each side

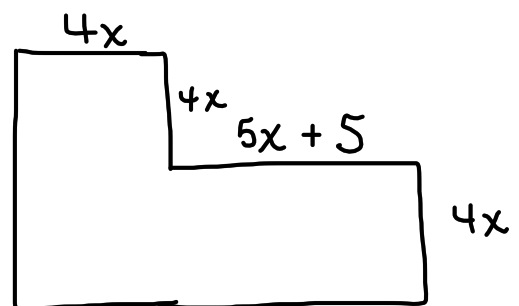
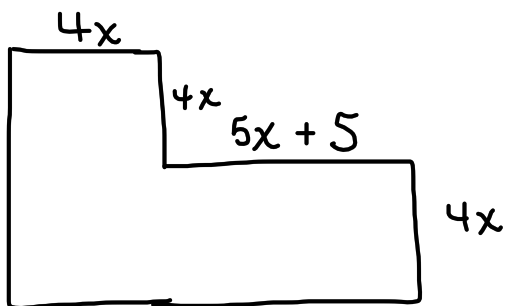
Write a polynomial to represent the perimeter of the rectangle.

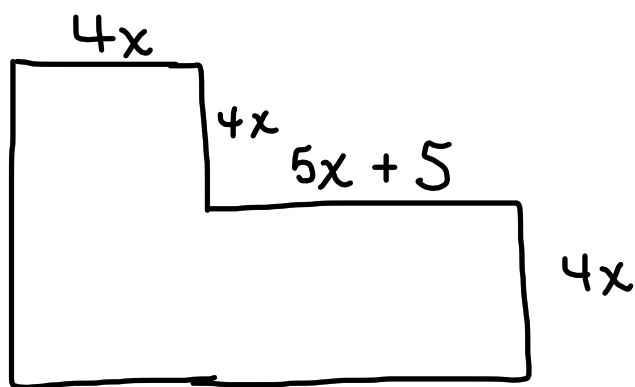
Example 2) Write a polynomial to represent the perimeter of each rectangle.



Example 3) Use algebra tile to make the rectangle with perimeter $6x + 4$









Section 5.3 Adding Polynomials

$$(6x^2 + 2x + 9) \oplus (-3x^2 + 4x - 5)$$

$$\boxed{6x^2} \boxed{+2x} \boxed{+9} \quad \boxed{-3x^2} \boxed{+4x} \boxed{-5}$$

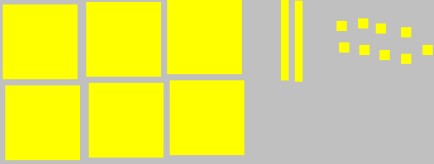
$$3x^2 + 6x + 4$$

don't copy

We can solve the question with or without algebra tiles.

Tiles

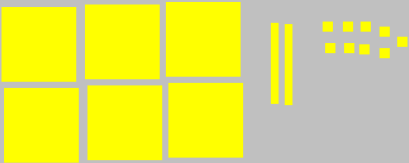
Display : $6x^2 + 2x + 9$



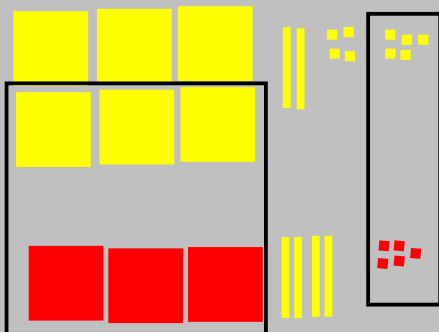
Display: $-3x^2 + 4x - 5$



Combine the displays.
(Group like Tiles)



Remove Zero Pairs.



The remaining tiles represent

$$3x^2 + 6x + 4$$

No Tiles

The sum is:

$$(6x^2 + 2x + 9) + (-3x^2 + 4x - 5)$$

This is written as:

$$6x^2 + 2x + 9 - 3x^2 + 4x - 5$$

Group like terms:

$$6x^2 - 3x^2 + 2x + 4x + 9 - 5$$

Combine like terms:

$$3x^2 + 6x + 4$$

$$(3x^2 + 6x - 5) - (-2x^2 + 10x - 2)$$
$$\boxed{3x^2} \boxed{+6x} - 5 \quad \boxed{+2x^2} \boxed{-10x} + 2$$
$$5x^2 - 4x - 3$$

Copy

Adding Polynomials Without Tiles

understood +1 in front of second bracket so distribute through

$$\text{Add: } (5c - 11) + (-4c^2 + c + 7)$$

We can add the polynomials by adding the coefficients of the like terms.
We can do this in two different ways:

Method 1:

Add horizontally:

$$(5c - 11) + (-4c^2 + c + 7) \text{ Remove the brackets.}$$

$$= 5c - 11 - 4c^2 + c + 7 \text{ Group like terms.}$$

$$= -4c^2 + 5c + c - 11 + 7 \text{ Combine like terms by adding their coefficients}$$

(remember that c has a coefficient of 1!)

$$= -4c^2 + 6c - 4$$

skip this

Method 2:

Add vertically. Line up the like terms, then add their coefficients.

$$\begin{array}{r} 5c - 11 \\ + \underline{-4c^2 + c + 7} \\ -4c^2 + 6c - 4 \end{array}$$



So, $(5c - 11) + (-4c^2 + c + 7) = -4c^2 + 6c - 4$

Adding Polynomials in Two Variables

$$\text{Add: } (3s^2 + s - 4c - 5cs + 2s^2) + (-5c^2 + 3cs + 6c - 4s + 7c^2)$$

Remove Brackets.

$$= 3s^2 + s - 4c - 5cs + 2s^2 - 5c^2 + 3cs + 6c - 4s + 7c^2$$

Group like terms.

$$= 3s^2 + 2s^2 + s - 4s - 4c + 6c - 5cs + 3cs - 5c^2 + 7c^2$$

Combine like terms.

$$= 5s^2 - 3s + 2c - 2cs + 2c^2$$

Create a Polynomial that
adds to give $4x^2 + 6x - 4$

When given:

$$-2x^2 + 2x - 6$$



1) If the sum of two polynomials is $3x^2 - 5x + 7$ and one polynomial is the following, determine the other polynomial.

a) $-7x^2 + 6x - 2$

b) $12x^2 - 18x$

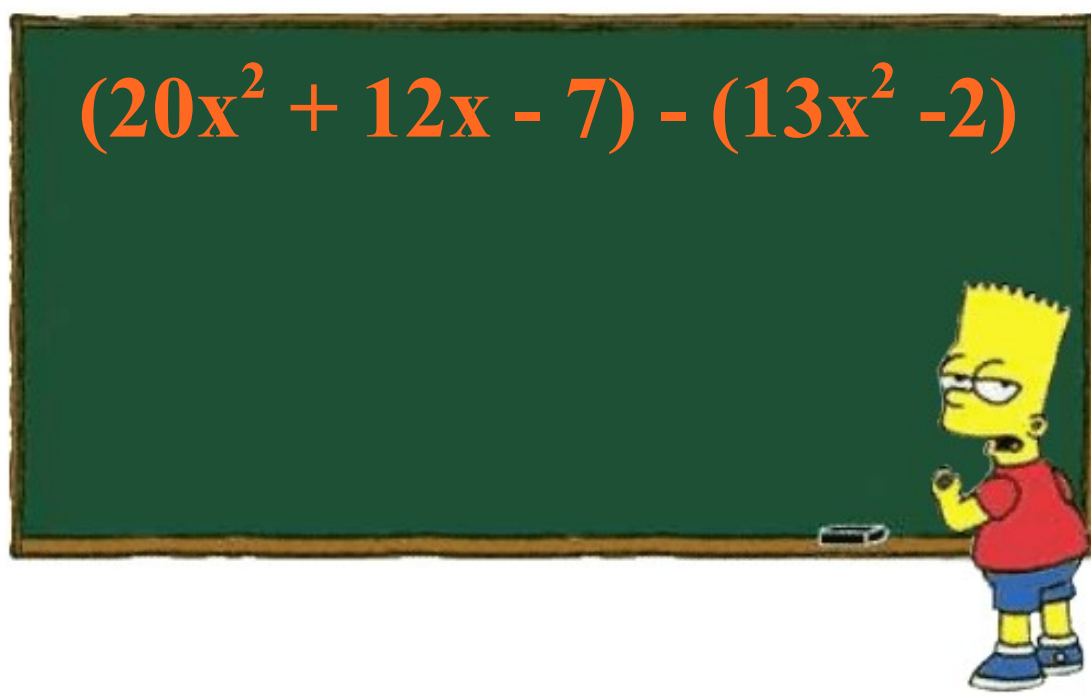
2) Make two shapes that corresponds to each given perimeter

a) $P = 3x + 11$

b) $P = 12x + 10$



You Try



Try This!

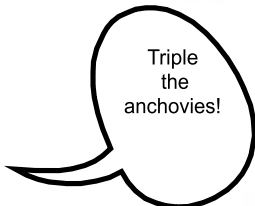
$$(6x^2 - 4x + 2) - (-8x^2 - 9x + 2)$$




Remove to
reveal
the answer:



Multiplication and Division of a Polynomial by a Constant



Try these:


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

$$\frac{36p + 45q - 81}{9}$$

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

$$(6z - 9)$$

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

$$(49t^2 - 7) \div (7)$$

$$(-2x^1) \quad (-3x^4 + 5x^3 - 7)$$

$$6x^5 - 10x^4 + 14x$$

$$\frac{-12x^5 + 6x^2}{3x^2}$$

$$\frac{-12x^5}{3x^2} + \frac{6x^2}{3x^2}$$

$$-4x^3 + 2$$

$$3x^4 \rightarrow$$

$$2x^1 \rightarrow$$

$$7 \rightarrow$$

$$\frac{1 + 5}{2} = \frac{1}{2} + \frac{5}{2}$$

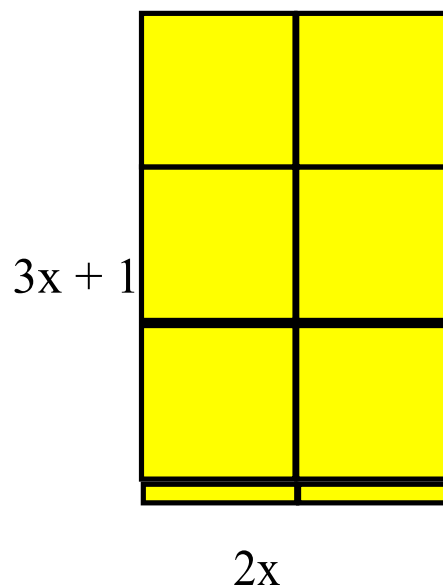
section 5.6

Multiplying and Dividing a Polynomial by a Monomial

$(2x)(3x + 1)$
Is this possible?



$$\text{Area} = L \times W$$



SOME REVIEW

Laws of Exponents

Remember... $b^x \rightarrow$ "b raised to the power of x" where, b – base
x – exponent

#1. PRODUCT - when multiplying...

"if the base is the same, then ADD the exponents."

Example

$$(2^6)(2^5)$$

$$b^m \times b^n = b^{m+n}$$

example

$$(x^6)(x^5)$$

#2. QUOTIENT - when dividing...

"if the base is the same, then SUBTRACT the exponents."

$$\frac{b^m}{b^n} = b^{m-n}$$

example:

$$\frac{(2^7)}{(2^4)} =$$

example:

$$\frac{(x^7)}{(x^4)} =$$

$$(x^2)(x) =$$

Multiplying a Monomial by a Monomial

Note:

Multiply coefficients
with coefficients and
variables with variables

Follow exponent laws for variable with the same base

$$(11)(5y^2)$$

$$(-7n)(5n)$$

$$(8m^5)(4m^2x)$$

$6y^2 \cdot 7y^3$

$= 42y^5$ SMILE 😊

Hint:
Coefficient and variables by their own kind

Just say your answer
(Time is up)

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Dividing a Monomial by a Monomial

Note:

Divide coefficients with
coefficients and
variables with variables

Follow exponent laws for variable with the same base

$$1) \frac{-8x^2}{2x}$$

$$2) \frac{150y^5}{25y^2}$$

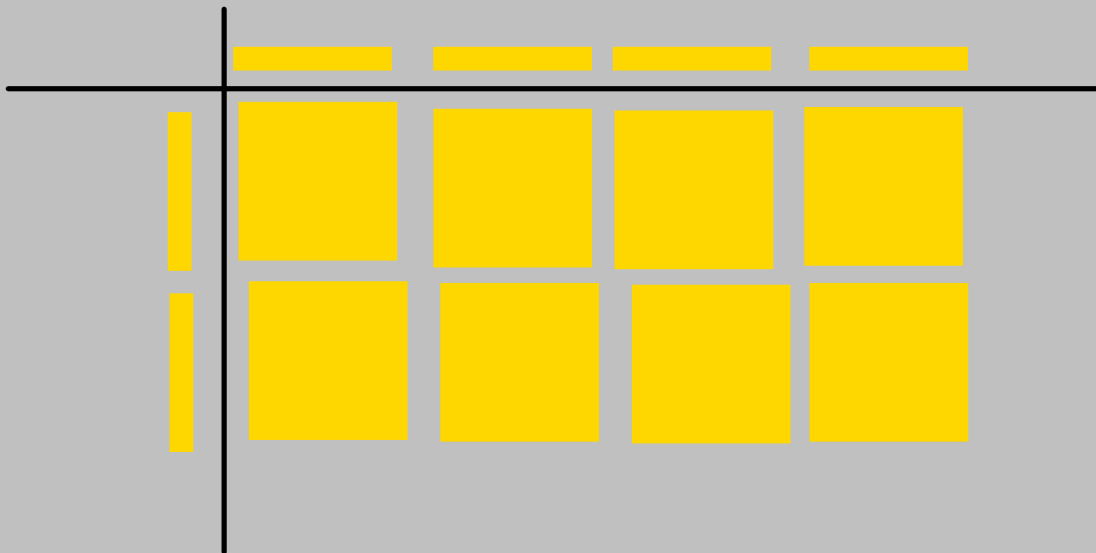
You Try!

$$1) \quad \frac{72x - 48x^2}{12x}$$

Algebra Tiles

Multiplication

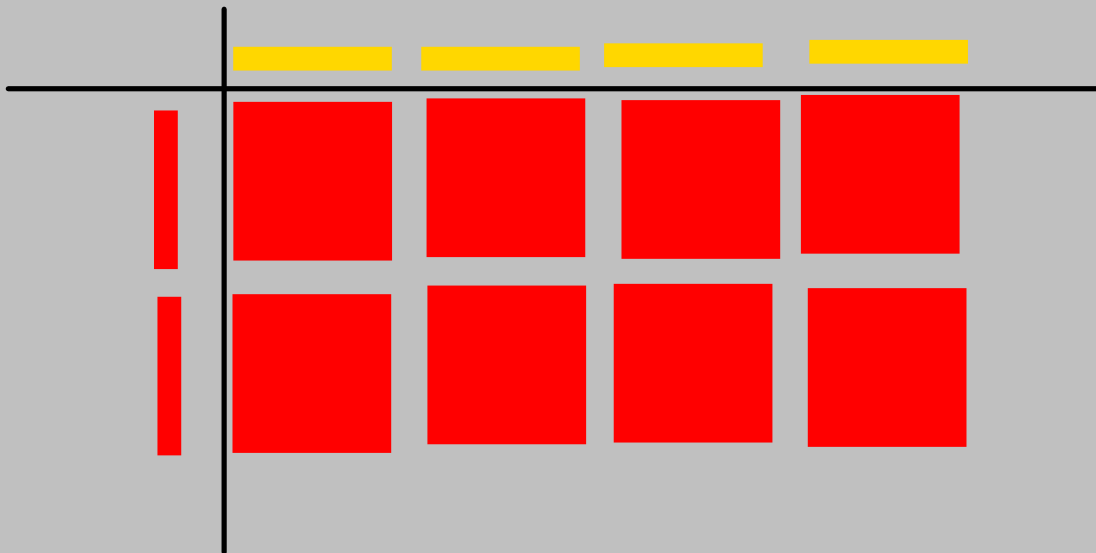
$$(2x)(4x) = 8x^2$$



Algebra Tiles

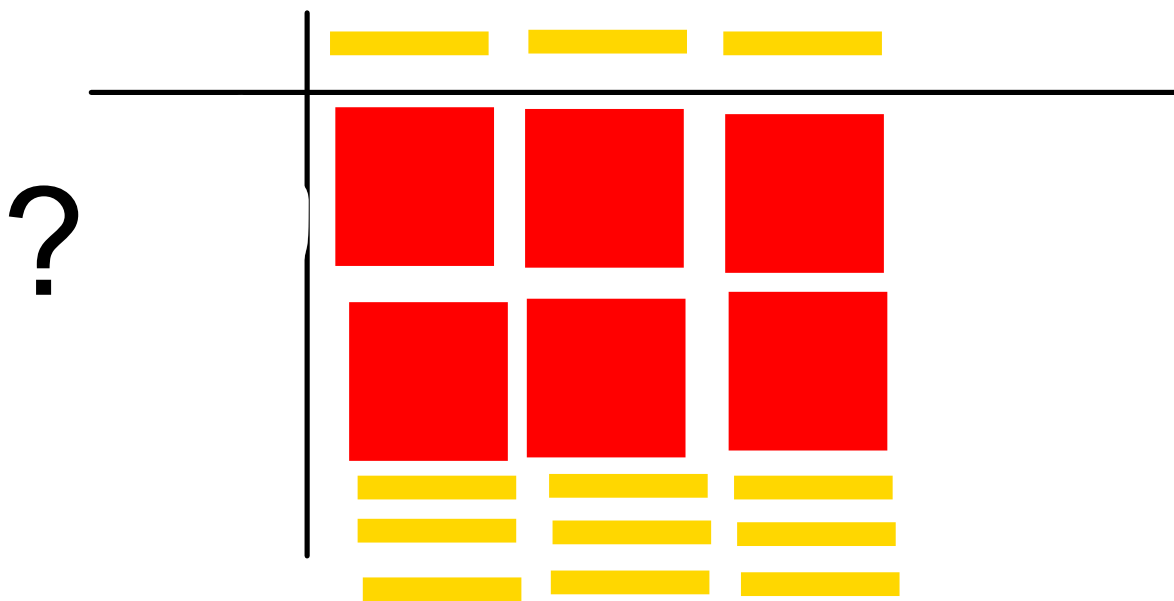
Multiplication

$$(-2x)(4x)$$



Algebra Tiles

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



Class/Homework

Pg 259 - 261

#6

#9

#12 a, d

#14 a

#15 a, b, c, d

#19 a

#22 a,c,h,k,l

#26 a,c,e,g

#28 b, d, f

**Check Answers in
back of textbook**