9-1 Adding and Subtracting Polynomials

. polynomial shown below is in **standard form of a polynomial** means that the degrees of its monomial term decreases from left to right.

$$3x^4 + 5x^2 - 7x + 1$$

After you simplify a polynomial by combining like terms, you will need to place the polynomial in standard form.

Write each polynomial in standard form.

$5 - 2x$	$3x^4 - 4 + 2x^2 + 5x^4$	$6x^2 + 7 - 9x^4$	$3y - 4 - y^3$
$-2x + 5$	$8x^4 + 2x^2 - 4$	$-9x^4 + 6x^2 + 7$	$-y^3 + 3y - 4$

You can add polynomials by combining like terms.

1. $(4x^2 + 6x + 7) + (2x^2 - 9x + 1)$

$$6x^2 - 3x + 8$$

2. Find the sum of $(w^2 + w - 4)$ and $(8 + 7w^2 - 4w)$

$$(w^2 + w - 4) + (8 + 7w^2 - 4w)$$

$$8w^2 - 3w + 4$$

You can subtract polynomials the same way but you must remember two things:
   1. You have to decide which polynomial will come first.
   2. You must <u>distribute the negative</u> to the second term.

FROM MEANS FIRST

3. $(7h^2 + 4h - 8) - (3h^2 - 2h + 10)$

$$7h^2 + 4h - 8 - 3h^2 + 2h - 10$$

$$4h^2 + 6h - 18$$

4. Subtract $(-6y^2 + y + 4)$ from $(-7y^2 + 3y - 1)$

$$(-7y^2 + 3y - 1) - 1(-6y^2 + 1y + 4)$$

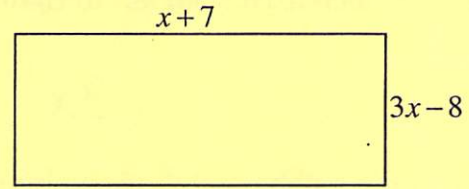$$-7y^2 + 3y - 1 + 6y^2 - 1y - 4$$

$$-1y^2 + 2y - 5$$

Finding Dimensions, Perimeter, Area, etc. of Figures

1. Express the Perimeter in simplest form.

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

$3x-9$ $x+16$

$8x$
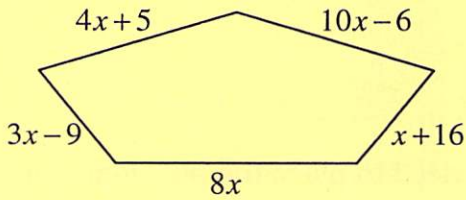
$$\boxed{26x + 6}$$

2. Express the Area in simplest form.

$x+7$

$3x-8$

$$(x+7)(3x-8)$$

$$\boxed{3x^2 + 13x - 56}$$
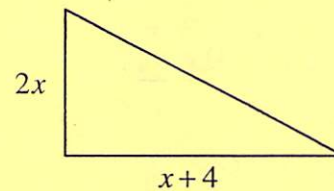
3. Find an expression for the missing length.

Perimeter = $23a - 7$

$6a+8$ $8a-9$
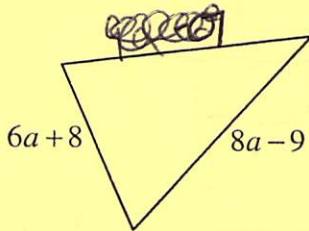
$$\boxed{9a - 6}$$

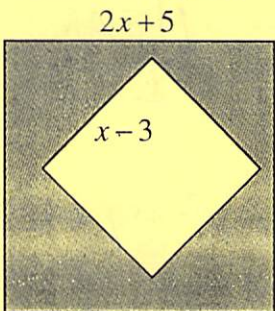4. Express the Area in simplest form.

Area = $\dfrac{1}{2}bh$

$2x$

$x+4$

$$\frac{1}{2}(2x)(x+4)$$

$$\boxed{x^2 + 4x}$$

5. The accompanying diagram shows a square with side $(x-3)$ inside a square with side $(2x+5)$. Express the area of the shaded region in simplest form.

$2x+5$

$x-3$

$(2x+5)$

$A_{BIG \square} - A_{SMALL \square}$

$$(2x+5)(2x+5) - (x-3)(x-3)$$

$$(4x^2+20x+25) - 1(x^2-6x+9)$$

$$4x^2+20x+25 - x^2 +6x - 9$$

$$\boxed{3x^2 + 26x + 16}$$

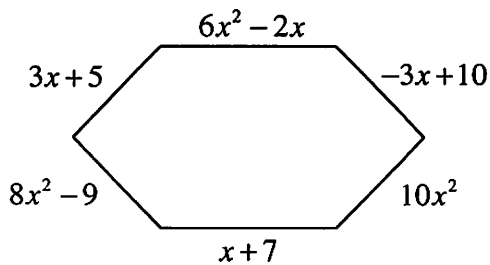Practice 9-1   Name _____

Simplify. Write each answer in simplest standard form.

1. What is the sum of $4x^3 + 6x^2 + 2x - 3$ and $3x^3 + 3x^2 - 5x - 5$?

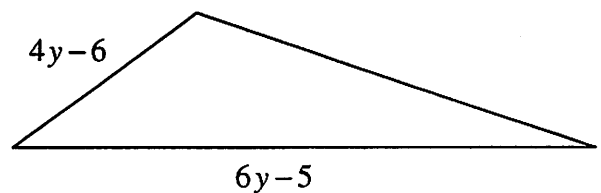2. Simplify the expression $(x^2 - 5x - 2) - (-6x^2 - 7x - 3)$.

3. Subtract $2x^2 + 3xy - 6$ from $x^2 - 7xy + 2$.

4. Express the Perimeter in simplest form.

$6x^2 - 2x$

$3x+5$ $-3x+10$

$8x^2 - 9$ $10x^2$

$x+7$

5. Find an expression for the missing length.
   Perimeter = $14y - 6$

$4y - 6$

$6y - 5$

6. A plastic storage box in the shape of a rectangular prism has a length of $x + 3$, a width of $x - 4$, and a height of 5. Represent the surface area of the box as a trinomial in terms of x.

(Hint: The equation for the surface area of a rectangular prism is $SA = 2lw + 2lh + 2wh$)