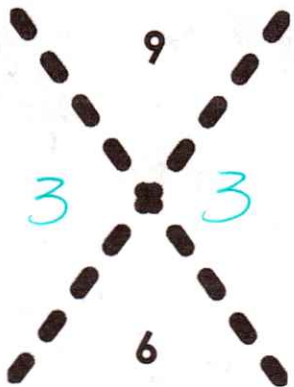
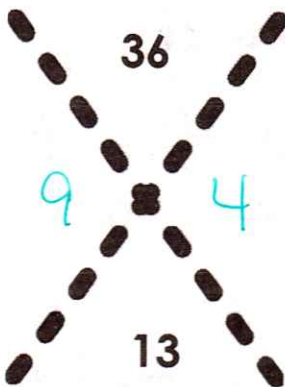
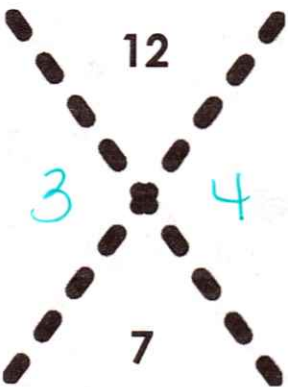
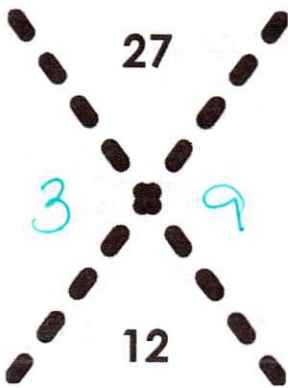
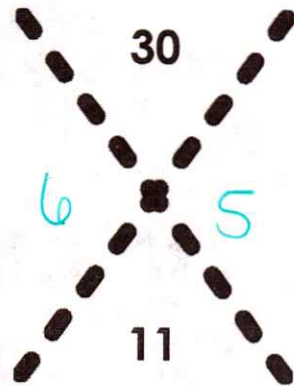
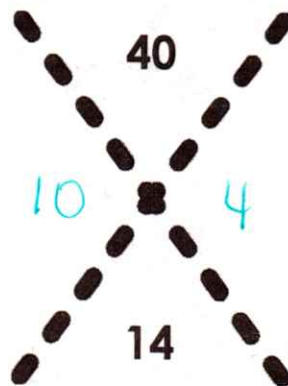
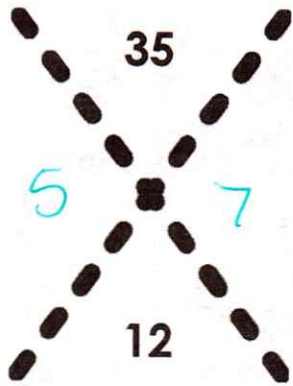
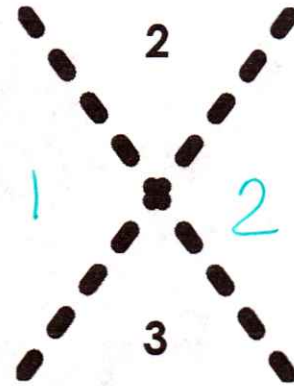
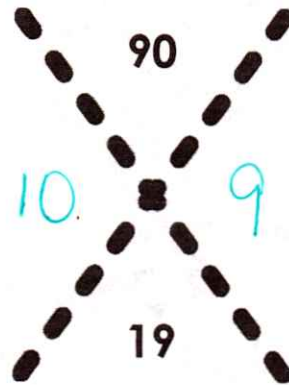
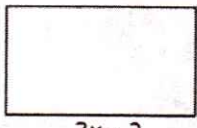


### Number Diamonds Puzzle #1

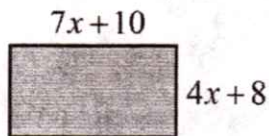


7.1 Operations with Polynomials Review

What you need to know & be able to do	Things to remember	Examples	
1. Classify polynomials	<b>Degree:</b> $x^3$ : cubic $x^2$ : quadratic $x$ : linear $\#$ : constant  <b>Number of Terms:</b> 1: Monomial 2: Binomial 3: Trinomial 4+: Polynomial  Make sure your expressions are simplified first!	1. $5x - 7$ $D: 1 \rightarrow$ linear $T: 2 \rightarrow$ binomial	2. $-18$ $D: 0 \rightarrow$ constant $T: 1 \rightarrow$ monomial
		3. $-2x^2 + 8 + 3x^2$ $D: 2 \rightarrow$ quadratic $T: 3 \rightarrow$ trinomial	4. $4x^2 + 3x - 10 + 2(x - 4)$ $4x^2 + 3x - 10 + 2x - 8$ $4x^2 + 5x - 18$ $D: 2 \rightarrow$ quadratic $T: 3 \rightarrow$ trinomial
2. Add and Subtract Polynomials	-Line up like terms  -If subtracting, change subtraction sign to addition and change the signs of every term in the 2 <sup>nd</sup> polynomial	5. $(4x + 3x^2 - 7) + (-6x^2 + 4)$ $3x^2 + 4x - 7$ $-6x^2 + 4$ $-3x^2 + 4x - 3$	6. $(4x^2 - 3x - 2) - (9x^2 + 3x - 7)$ $4x^2 - 3x - 2$ $-9x^2 - 3x + 7$ $-5x^2 - 6x + 5$
3. Multiply polynomials	-Distributive Method or Area Method  $-x \cdot x = x^2$	7. $5x(3x + 7)$ $5x \begin{array}{ c c } \hline 3x & 7 \\ \hline \end{array}$ $15x^2 + 35x$	8. $(x - 9)(x + 6)$ $x \begin{array}{ c c } \hline x & 6 \\ \hline \end{array}$ $-9 \quad -9x \quad -54$ $x^2 - 3x - 54$
		9. $(x + 4)^2$ $(x + 4)(x + 4)$ $x^2 + 4x + 4x + 16$ $x^2 + 8x + 16$	10. $(6x + 3)(4x - 8)$ $24x^2 - 48x + 12x - 24$ $24x^2 - 36x - 24$
4. Area & Perimeter	Perimeter: Add up all outside sides  Area: Rectangle: $A = l \times w$ Triangle: $A = \frac{1}{2}bh$  $P: 2x + b$ $2x + b$ $3x - 2$ $3x - 2$ $10x + 8$	11. Find the area & perimeter of the following:  $3x - 2$ $2x + 6$ $A: (3x - 2)(2x + 6)$ $6x^2 + 18x - 4x - 12$ $A: 6x^2 + 14x - 12$	12. The area of a rectangle is $x^2 + 7x + 6$ . What is the <b>perimeter</b> of this rectangle? <del>_____</del>

## Day 4: Applications Using Polynomials

a. Write an expression that represents the perimeter and area of this rectangle.



$$A: (7x+10)(4x+8)$$

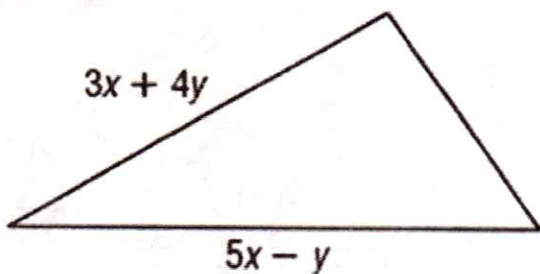
$$28x^2 + 56x + 40x + 80$$

$$A: 28x^2 + 96x + 80$$

$$P: 7x+10 + 7x+10 + 4x+8 + 4x+8$$

$$P: 22x + 36$$

b. The measures of two sides of a triangle are given. If  $P$  is the perimeter, and  $P = 18x + 9y$ , find the measure of the third side.



$$3x+4y + 5x-y$$

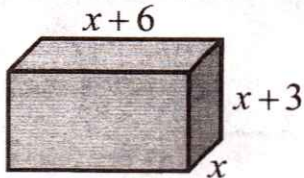
$$8x+3y + (\text{third side}) = 18x+9y$$

$$-8x - 3y$$

$$-8x - 3y$$

$$\text{third side} = 10x + 6y$$

c. Write an expression that represents the volume of this rectangular prism. ( $V = lwh$ )



$$(x+6)(x+3)$$

$$x^2 + 3x + 6x + 18$$

$$(x^2 + 9x + 18)(x)$$

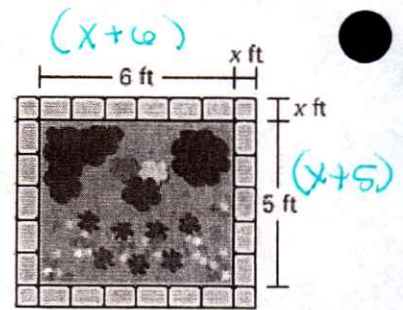
$$x^3 + 9x^2 + 18x$$

d. You are designing a rectangular flower bed that you will border using brick pavers. The width of the board around the bed will be the same on every side, as shown.

a. Write a polynomial that represents the total area of the flower bed and border.

$$(x+6)(x+5)$$

	$x$	$5$	
$x$	$x^2$	$5x$	$\rightarrow x^2 + 11x + 30$
$6$	$6x$	$30$	



b. Find the total area of the flower bed and border when the width of the border is 1.5 feet.

\*Substitute in for  $x$

$$(1.5)^2 + 11(1.5) + 30$$

$$A = 48.75 \text{ ft}^2$$

e. Find the expression that represents the area not covered by the mailing label.

$$(6x+5)(4x+4)$$

Gray area

$$24x^2 + 24x + 20x + 20$$

$$24x^2 + 44x + 20$$

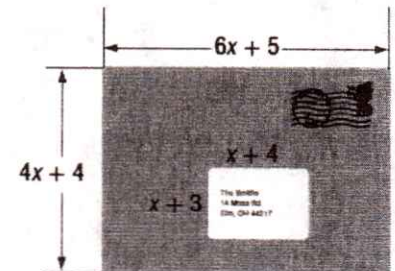
$$(x+4)(x+3)$$

$$x^2 + 3x + 4x + 12$$

$$x^2 + 7x + 12$$

gray - label

$$(24x^2 + 44x + 20) - (x^2 + 7x + 12)$$



$$24x^2 + 44x + 20$$

$$- x^2 - 7x - 12$$

$$\boxed{23x^2 + 37x + 8}$$

f. The polynomial  $c(x) = x^2 - 7x + 15$  models the cost a company incurs from making an item at a price  $x$ . The polynomial  $i(x) = 3x^2 + 4x - 50$  represents the income from selling the same item at a price  $x$ . Write a polynomial that expresses the profit from making and selling the item. (hint: profit = income - cost)

$$(3x^2 + 4x - 50) - (x^2 - 7x + 15)$$

$$3x^2 + 4x - 50$$

$$- x^2 + 7x - 15$$

$$P: \boxed{2x^2 + 11x - 65}$$

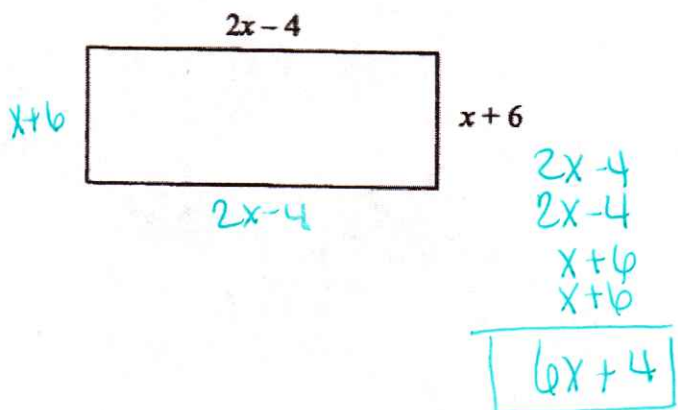
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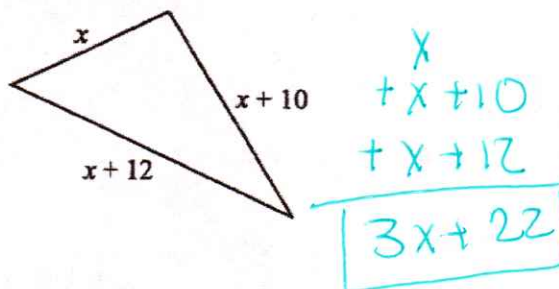
Practice Assignment

1. Find the perimeter of the following figures: (Add)

a.



b.



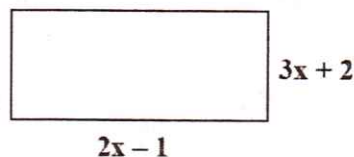
2. The measure of the perimeter of a triangle is  $37x + 42$ . It is known that two of the sides of the triangle have measures of  $14x + 16$  and  $10x + 20$ . Find the length of the third side.

$$\begin{array}{r}
 14x+16 \\
 10x+20 \\
 \hline
 24x+36 \\
 -24x-36 \\
 \hline
 13x+6
 \end{array}
 + (\text{third side}) = 37x+42$$

3. A rectangle has a perimeter of  $12y^2 - 2y + 18$  and has a width of  $4y^2 - y + 6$ . What is the length of the rectangle?

$4y^2-y+6$   
 $4y-y+6$   
 $4y^2-y+6$   
 $4y^2-y+6$   
 $+ \text{length}$   
 $+ \text{length}$   
 $12y^2-2y+18$   
 $8y^2-2y+12$   
 $+ 2(\text{length}) \leftarrow 4y^2+6$   
 $12y^2-2y+18$   
 $\div 2$  since there are two lengths.  
 $l: 2y^2+3$

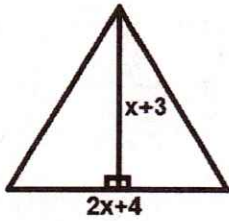
4. Write an expression for the perimeter and area of the following rectangle.



$P: 2(3x+2) + 2(2x-1)$   
 $6x+4 + 4x-2$   
 $P: 10x+2$

$A: (3x+2)(2x-1)$   
 $6x^2-3x+4x-2$   
 $A: 6x^2+x-2$

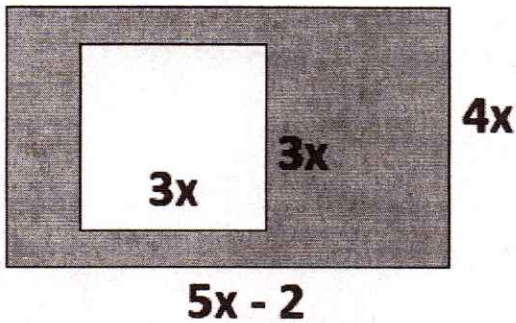
5. Write an expression for the area of the triangle ( $A = \frac{bh}{2}$  or  $A = \frac{1}{2}bh$ ).



$$A: \frac{(x+3)(2x+4)}{2} \rightarrow \frac{2x^2+4x+6x+12}{2}$$

$$\frac{2x^2+10x+12}{2} \rightarrow \boxed{x^2+5x+6}$$

6. Find the area of the shaded region:



$$\text{Dark: } 4x(5x-2) \quad \text{White: } 3x(3x)$$

$$20x^2-8x \quad 9x^2$$

$$\text{Dark - white}$$

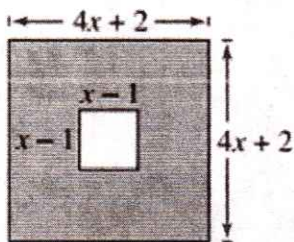
$$20x^2-8x-(9x^2)$$

$$20x^2-8x$$

$$-9x^2$$

$$\boxed{11x^2-8x}$$

7. Find the area of the shaded region:



$$\text{Dark: } (4x+2)(4x+2)$$

$$16x^2+8x+8x+4$$

$$16x^2+16x+4$$

$$\text{White: } (x-1)(x-1)$$

$$x^2-1x-1x+1$$

$$x^2-2x+1$$

$$\text{Dark - white}$$

$$(16x^2+16x+4)-(x^2-2x+1)$$

$$16x^2+16x+4$$

$$-x^2+2x-1$$

$$\boxed{15x^2+18x+3}$$

8. The polynomial  $c(x) = x^2 + 4x - 10$  models the cost a company incurs from making an item at a price  $x$ . The polynomial  $i(x) = 4x^2 - x + 20$  represents the income from selling the same item at a price  $x$ . Write a polynomial that expresses the profit from making and selling the item. (hint: profit = income - cost)

$$(4x^2-x+20)-(x^2+4x-10)$$

$$4x^2-x+20$$

$$-x^2-4x+10$$

$$\boxed{3x^2-5x+30}$$