

**Math 10-C Polynomials Assignment List**

Name: \_\_\_\_\_

KEY

**C1: Polynomial Intro & Review**

- Adding & Subtracting Polynomials
- Factoring Monomials

**C2: Multiplying Polynomials**

- Distributive Property Practice
- CP pg. 69:1-18
- CP pg. 83
- Text pg. 87: 7, 8, 10, 13, 14

**C3: Factoring Polynomials**

- C3 Factoring Polynomials Assignment #1
- Rectangles and Algebra Tiles Chart #1
- Rectangles and Algebra Tiles Chart #2
- Rectangles and Algebra Tiles Chart #3
- C3 Factoring Concretely & Pictorially Assignment
- C3 Factoring Symbolically Assignment
- Text pg. 99: 1, 2ad, 3bc, 5-7, 10, 13

**Polynomials Chapter Review Assignment**

## Adding and Subtracting Polynomials

Simplify each expression.

1)  $(5 + 5n^3) - (1 - 3n^3)$   
 $8n^3 + 4$

2)  $(6a - 3a^2) + (2a^2 - 3a)$   
 $-a^2 + 3a$

3)  $(x^2 - x) + (8x - 2x^2)$   
 $-x^2 + 7x$

4)  $(2a^2 + 4a^3) - (3a^3 + 8)$   
 $a^3 + 2a^2 - 8$

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

6)  $(8n^2 - 2n^3) + (6n^3 - 8n^2)$   
 $4n^3$

7)  $(8b^3 + 8) - (6 - 7b^3)$   
 $15b^3 + 2$

8)  $(4x^3 - 6) + (5x^3 + 3)$   
 $9x^3 - 3$

9)  $(10p^4 + 11) - (11p^4 + 13 + 16p^2)$   
 $-p^4 - 16p^2 - 2$

10)  $(20v^2 - 9v^3) - (7v^3 - 10v^4 - 14v^2)$   
 $10v^4 - 16v^3 + 34v^2$

11)  $(10x^4 - 16) + (12 - 6x^3 + 11x^4)$   
 $21x^4 - 6x^3 - 4$

12)  $(14 + 12a^3) + (17a^4 + 15 - 5a^3)$   
 $17a^4 + 7a^3 + 29$

## Factoring Monomials

Write the prime factorization of each. Do not use exponents.

1)  $25n^2$

$$5 \cdot 5 \cdot n \cdot n$$

2)  $18xy$

$$2 \cdot 3 \cdot 3 \cdot x \cdot y$$

3)  $12a$

$$2 \cdot 2 \cdot 3 \cdot a$$

4)  $21y^2$

$$3 \cdot 7 \cdot y \cdot y$$

5)  $81a$

$$3 \cdot 3 \cdot 3 \cdot 3 \cdot a$$

6)  $92q$

$$2 \cdot 2 \cdot 23 \cdot q$$

7)  $36x^3$

$$2 \cdot 2 \cdot 3 \cdot 3 \cdot x \cdot x \cdot x$$

8)  $24h$

$$2 \cdot 2 \cdot 2 \cdot 3 \cdot h$$

9)  $48x^2$

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot x \cdot x$$

10)  $92xy$

$$2 \cdot 2 \cdot 23 \cdot x \cdot y$$

11)  $18x^2$

$$2 \cdot 3 \cdot 3 \cdot x \cdot x$$

12)  $50x$

$$2 \cdot 5 \cdot 5 \cdot x$$

# M10C - Distributive Property Practice C.2

KEY

1. a)  $7 \times 84$

Grid

	80	4
7	560	28

= 588

Rainbow

$7(80 + 4)$   
 $= 560 + 28$   
 $=$  588

Classic

	84
$\times 7$	
	588

b)  $14 \times 26$

Grid

	20	6
10	200	60
4	80	24

= 364

Rainbow

$(10 + 4)(20 + 6)$   
 $= 200 + 60 + 80 + 24$   
 $=$  364

Classic

	26
$\times 14$	
	104
	260
	364

2. a)  $6(100 + 60 + 2)$   
 $= 600 + 360 + 12$   
 $=$  972

b)  $(30 + 2)(20 + 5)$   
 $= 600 + 150 + 40 + 10$   
 $=$  800

3. a) 

	20	1
8	160	8

  
 $=$  168

b) 

	10	8
10	100	80
5	50	40

  
 $=$  270

c) 

	10	3
30	300	90
6	60	18

  
 $=$  468

4. a) 

	10	7
4	40	28

  
 $4 \times 17 = 68$

b) 

	10	6
10	100	60
5	50	30

  
 $15 \times 16 = 240$

★ #4 - answers may vary.

c) 

	10	9
10	100	90
2	20	18

  
 $12 \times 19 = 228$

d) 

	20	7
10	200	70
5	100	35

  
 $15 \times 27 = 405$

M10-C C3- Factoring Polynomials Assn #1 KEY

1. a) 5      b) 16      c) 6      d) 12

2. a)  $\frac{3}{8}$       b)  $\frac{3}{8}$       c)  $\frac{4}{11}$       d)  $\frac{17}{19}$

a)  $x-5$  + Binomial      b)  $(6x^2+12x+6)$  by  $x^2$  → all terms

3. a) 2      b) 3      c) 15

4. a)  $7x+49$       GCF = 7      Dimensions  $\Rightarrow 7(x+7)$

$$7 \begin{array}{|l} \hline A=7x+49 \\ \hline x+7 \end{array} \qquad \begin{array}{r} x+7 \\ 7 \overline{) 7x+49} \checkmark \end{array}$$

b)  $6x^2+24x$       GCF =  $6x$       Dimensions  $\Rightarrow 6x(x+4)$

$$6x \begin{array}{|l} \hline A=6x^2+24x \\ \hline x+4 \end{array} \qquad \begin{array}{r} x+4 \\ 6x \overline{) 6x^2+24x} \checkmark \end{array}$$

c)  $8x-40$       GCF = 8      Dimensions  $\Rightarrow 8(x-5)$

$$8 \begin{array}{|l} \hline A=8x-40 \\ \hline x-5 \end{array} \qquad \begin{array}{r} x-5 \\ 8 \overline{) 8x-40} \checkmark \end{array}$$

d)  $4x^2-20x$       GCF =  $4x$       Dimensions  $\Rightarrow 4x(x-5)$

$$4x \begin{array}{|l} \hline A=4x^2-20x \\ \hline x-5 \end{array} \qquad \begin{array}{r} x-5 \\ 4x \overline{) 4x^2-20x} \checkmark \end{array}$$

e)  $3x+9xy+6xz$       GCF =  $3x$       Dimensions  $\Rightarrow 3x(1+3y+2z)$

$$3x \begin{array}{|l} \hline A=3x+9xy+6xz \\ \hline 1+3y+2z \end{array} \qquad \begin{array}{r} 1+3y+2z \\ 3x \overline{) 3x+9xy+6xz} \checkmark \end{array}$$

f)  $3ax + 3ay$     GCF =  $3a$     Dimensions  $\Rightarrow 3a(x+y)$

$3a \boxed{A = 3ax + 3ay}$   
 $x+y$

$$\begin{array}{r|l} & x+y \\ 3a & 3ax+3ay \end{array} \checkmark$$

g)  $-3x^3 + 6x^2 - 9x$     GCF =  $-3x$     Dimensions  $\Rightarrow -3x(x^2 - 2x + 3)$

$-3x \boxed{A = -3x^3 + 6x^2 - 9x}$   
 $x^2 - 2x + 3$

$$\begin{array}{r|l} & x^2 - 2x + 3 \\ -3x & -3x^3 + 6x^2 - 9x \end{array} \checkmark$$

h)  $-12x^2y^2 + 3xy^3 - 15x^3y$     GCF =  $-3xy$     Dimensions  $\Rightarrow -3xy(4xy - y^2 + 5x^2)$

$-3xy \boxed{A = -12x^2y^2 + 3xy^3 - 15x^3y}$   
 $4xy - y^2 + 5x^2$

$$\begin{array}{r|l} & 4xy - y^2 + 5x^2 \\ -3xy & -12x^2y^2 + 3xy^3 - 15x^3y \end{array}$$

i)  $x(x-3) + 2(x-3)$     GCF =  $(x-3)$     Dimensions  $\Rightarrow (x-3)(x+2)$

$(x-3) \boxed{A = x(x-3) + 2(x-3)}$   
 $= x^2 - 3x + 2x - 6$   
 $= x^2 - x - 6$   
 $(x+2)$

$$\begin{array}{r|l} & x+2 \\ x & x^2 - 3x \\ -3 & -3x - 6 \end{array} = x^2 - x - 6$$

$x \Rightarrow x$   $A = (x-3)(x+2)$

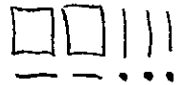

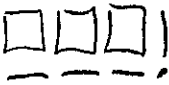
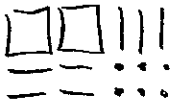

$$\begin{array}{r|l} & x+2 \\ x & x^2 - 3x \\ -3 & -3x - 6 \end{array} = x^2 - x - 6$$

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M10-C Polynomials

Name: KEY

Rectangles and Algebra Tiles #1

Polynomial	Sketch of Rectangle	Grid	Dimensions (factors)
$2x^2 + 5x + 3$		$\begin{array}{r l} & 2x + 3 \\ \hline x & 2x^2 \quad 3x \\ +1 & 2x \quad 3 \end{array}$	$(x+1)(2x+3)$
$x^2 + 5x + 6$		$\begin{array}{r l} & x + 3 \\ \hline x & x^2 \quad 3x \\ +2 & 2x \quad 6 \end{array}$	$(x+2)(x+3)$
$3x^2 + 4x + 1$		$\begin{array}{r l} & 3x + 1 \\ \hline x & 3x^2 \quad x \\ +1 & 3x \quad 1 \end{array}$	$(x+1)(3x+1)$
$2x^2 + 7x + 6$		$\begin{array}{r l} & 2x + 3 \\ \hline x & 2x^2 \quad 3x \\ +2 & 4x \quad 6 \end{array}$	$(x+2)(2x+3)$
$x^2 + 7x + 12$		$\begin{array}{r l} & x + 3 \\ \hline x & x^2 \quad 3x \\ +4 & 4x \quad 12 \end{array}$	$(x+4)(x+3)$



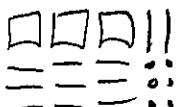
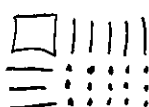
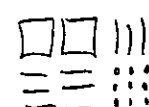
$3x^2 + 8x + 4$		$\begin{array}{r l} & 3x + 2 \\ \times & 3x^2 + 2x \\ +2 & 6x + 4 \end{array}$	$(x+2)(3x+2)$
$2x^2 + 7x + 5$		$\begin{array}{r l} & 2x + 5 \\ \times & 2x^2 + 5x \\ +1 & 2x + 5 \end{array}$	$(x+1)(2x+5)$
$2x^2 + 25x + 12$		$\begin{array}{r l} & 2x + 1 \\ \times & 2x^2 + x \\ +12 & 24x + 12 \end{array}$	$(x+12)(2x+1)$
$2x^2 + 7x + 3$		$\begin{array}{r l} & 2x + 1 \\ \times & 2x^2 + x \\ +3 & 6x + 3 \end{array}$	$(x+3)(2x+1)$
$2x^2 + 11x + 12$		$\begin{array}{r l} & 2x + 3 \\ \times & 2x^2 + 3x \\ +4 & 8x + 12 \end{array}$	$(x+4)(2x+3)$



# M10-C Polynomials

Name: KEY

## Rectangles and Algebra Tiles Chart #2

Polynomial	Sketch of Rectangle	Grid	Factors
$x^2 + 3x + 2$		$\begin{array}{r l} & x \quad +2 \\ \hline x & x^2 \quad 2x \\ +1 & x \quad 2 \end{array}$	$(x+1)(x+2)$
$2x^2 + 3x + 1$		$\begin{array}{r l} & 2x \quad +1 \\ \hline x & 2x^2 \quad x \\ +1 & 2x \quad 1 \end{array}$	$(x+1)(2x+1)$
$3x^2 + 11x + 6$		$\begin{array}{r l} & 3x \quad +2 \\ \hline x & 3x^2 \quad 2x \\ +3 & 9x \quad 6 \end{array}$	$(x+3)(3x+2)$
$x^2 + 8x + 15$		$\begin{array}{r l} & x \quad +5 \\ \hline x & x^2 \quad 5x \\ +3 & 3x \quad 15 \end{array}$	$(x+3)(x+5)$
$2x^2 + 9x + 9$		$\begin{array}{r l} & 2x \quad +3 \\ \hline x & 2x^2 \quad 3x \\ +3 & 6x \quad 9 \end{array}$	$(x+3)(2x+3)$

$3x^2+13x+4$		$\begin{array}{r l} & 3x+1 \\ \times & 3x^2 \quad \times \\ +4 & 12x \quad 4 \end{array}$	$(x+4)(3x+1)$
$6x^2+5x+1$		$\begin{array}{r l} & 3x+1 \\ 2x & 6x^2 \quad 2x \\ +1 & 3x \quad 1 \end{array}$	$(2x+1)(3x+1)$
$5x^2+13x+6$		$\begin{array}{r l} & 5x+3 \\ \times & 5x^2 \quad 3x \\ +2 & 10x \quad 6 \end{array}$	$(5x+3)(x+2)$
$5x^2+8x+3$		$\begin{array}{r l} & 5x+3 \\ \times & 5x^2 \quad 3x \\ +1 & 5x \quad 3 \end{array}$	$(x+1)(5x+3)$
$8x^2+18x+9$		$\begin{array}{r l} & 4x+3 \\ 2x & 8x^2 \quad 6x \\ +3 & 12x \quad 9 \end{array}$	$(2x+3)(4x+3)$

M10-C Polynomials

Name: KEY

Rectangles and Algebra Tiles Chart #3

Polynomial	Sketch of Rectangle	Grid	Factors
$x^2 + 4x - 5$		$\begin{array}{r rr} & x & +5 \\ x & x^2 & 5x \\ -1 & -x & -5 \end{array}$	$(x-1)(x+5)$
$x^2 - 8x + 7$		$\begin{array}{r rr} & x & -7 \\ x & x^2 & -7x \\ -1 & -x & +7 \end{array}$	$(x-1)(x-7)$
$2x^2 + x - 3$		$\begin{array}{r rr} & x & -1 \\ 2x & 2x^2 & -2x \\ +3 & 3x & -3 \end{array}$	$(x-1)(2x+3)$
$x^2 - 7x + 10$		$\begin{array}{r rr} & x & -2 \\ x & x^2 & -2x \\ -5 & -5x & +10 \end{array}$	$(x-5)(x-2)$
$2x^2 - 9x + 9$		$\begin{array}{r rr} & 2x & -3 \\ x & 2x^2 & -3x \\ -3 & -6x & +9 \end{array}$	$(x-3)(2x-3)$

$3x^2 - x - 4$		$\begin{array}{r l} & 3x - 4 \\ x & 3x^2 - 4x \\ +1 & +3x - 4 \end{array}$	$(x+1)(3x-4)$
$2x^2 + x - 10$		$\begin{array}{r l} & 2x + 5 \\ x & 2x^2 + 5x \\ -2 & -4x - 10 \end{array}$	$(x-2)(2x+5)$
$5x^2 + 7x - 6$		$\begin{array}{r l} & x + 2 \\ 5x & 5x^2 + 10x \\ -3 & -3x - 6 \end{array}$	$(5x-3)(x+2)$
$2x^2 - 5x - 12$		$\begin{array}{r l} & 2x + 3 \\ x & 2x^2 + 3x \\ -4 & -8x - 12 \end{array}$	$(x-4)(2x+3)$
$3x^2 - 14x + 8$		$\begin{array}{r l} & 3x - 2 \\ x & 3x^2 - 2x \\ -4 & -12x + 8 \end{array}$	$(x-4)(3x-2)$

M10C - Polynomials CB Factoring Concretely + Factorially Assign

KEY

1. a) (x+3)(x+2) = x^2 + 5x + 6

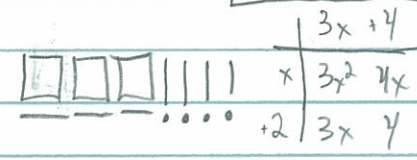
b) (x+3)(x-3) = x^2 - 9

c) (x+1)(x-4) = x^2 - 3x - 4

d) (x+2)(x-3) = x^2 - x - 6

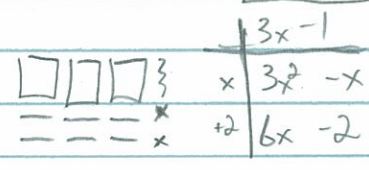
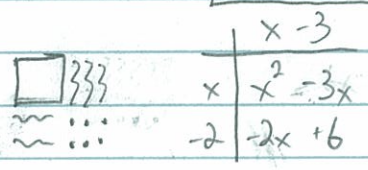
2. a) 2x^2 + 5x + 3 = (x+1)(2x+3)

b) 3x^2 + 7x + 4 = (x+2)(3x+4)



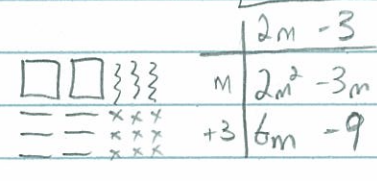
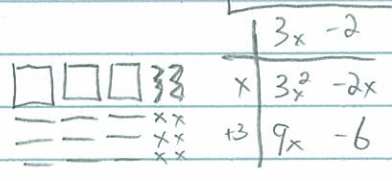
c) x^2 - 5x + 6 = (x-2)(x-3)

d) 3x^2 + 5x - 2 = (x+2)(3x-1)



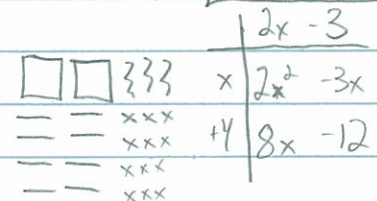
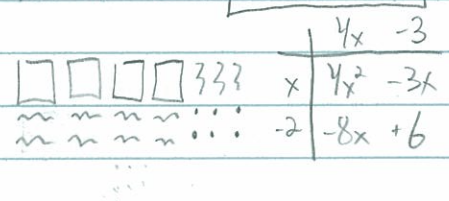
e) 3x^2 + 7x - 6 = (x+3)(3x-2)

f) 2m^2 + 3m - 9 = (m+3)(2m-3)

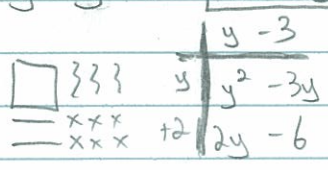


g) 4x^2 - 11x + 6 = (x-2)(4x-3)

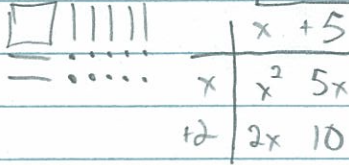
h) 2x^2 + 5x - 12 = (x+4)(2x-3)



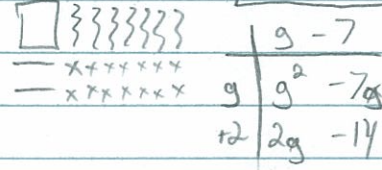
i) y^2 - y - 6 = (y+2)(y-3)



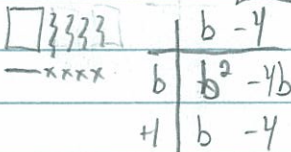
3. a)  $2x^2 + 14x + 20 = 2(x^2 + 7x + 10)$   
 $= 2(x+2)(x+5)$



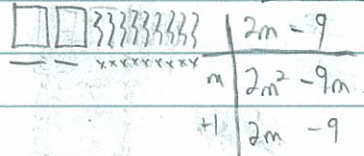
b)  $2g^2 - 10g - 28 = 2(g^2 - 5g - 14)$   
 $= 2(g+2)(g-7)$



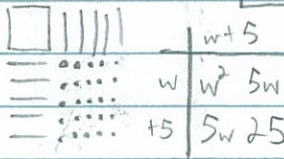
c)  $3b^2 - 9b - 12 = 3(b^2 - 3b - 4)$   
 $= 3(b+1)(b-4)$



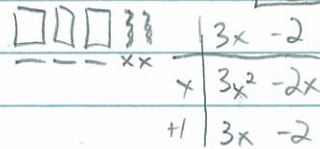
d)  $8m^2 - 28m - 36 = 4(2m^2 - 7m - 9)$   
 $= 4(m+1)(2m-9)$



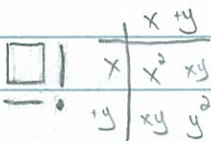
e)  $w^3 + 10w^2 + 25w = w(w^2 + 10w + 25)$   
 $= w(w+5)(w+5)$



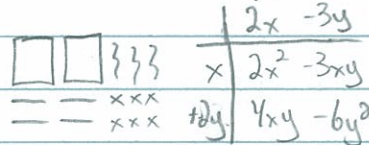
f)  $6x^2y + 2xy - 4y = 2y(3x^2 + x - 2)$   
 $= 2y(x+1)(3x-2)$



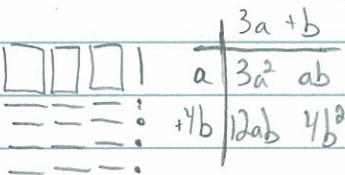
4. a)  $x^2 + 2xy + y^2 = (x+y)(x+y)$



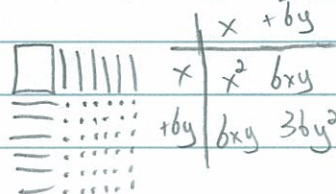
b)  $2x^2 + xy - 6y^2 = (x+2y)(2x-3y)$



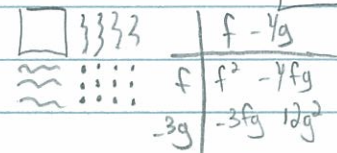
c)  $3a^2 + 12ab + 4b^2 = (a+4b)(3a+b)$



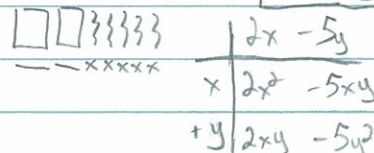
d)  $x^2 + 12xy + 36y^2 = (x+6y)(x+6y)$



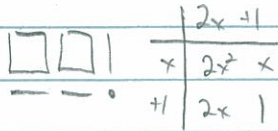
e)  $2f^2 - 14fg + 24g^2 = 2(f^2 - 7fg + 12g^2)$   
 $= 2(f-3g)(f-4g)$



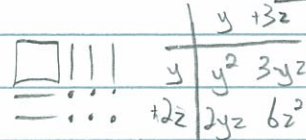
f)  $6x^2 - 9xy - 15y^2 = 3(2x^2 - 3xy - 5y^2)$   
 $= 3(x+y)(2x-5y)$



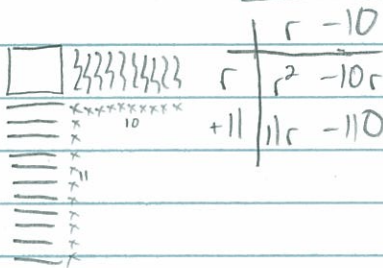
5. a)  $2x^2 + 3x + 1 = (x+1)(2x+1)$



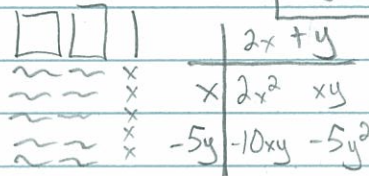
b)  $y^2 + 5yz + 6z^2 = (y+2z)(y+3z)$



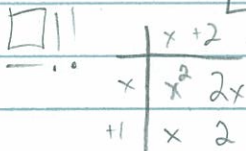
c)  $r^2 + r - 110 = (r+11)(r-10)$



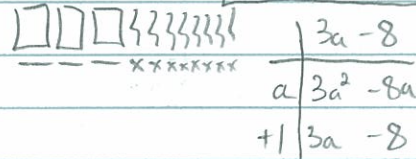
d)  $4x^2 - 18xy - 10y^2 = 2(2x^2 - 9xy - 5y^2) = 2(x-5y)(2x+y)$



e)  $3x^2 + 9x^2 + 6x = 3x(x^2 + 3x + 2) = 3x(x+1)(x+2)$

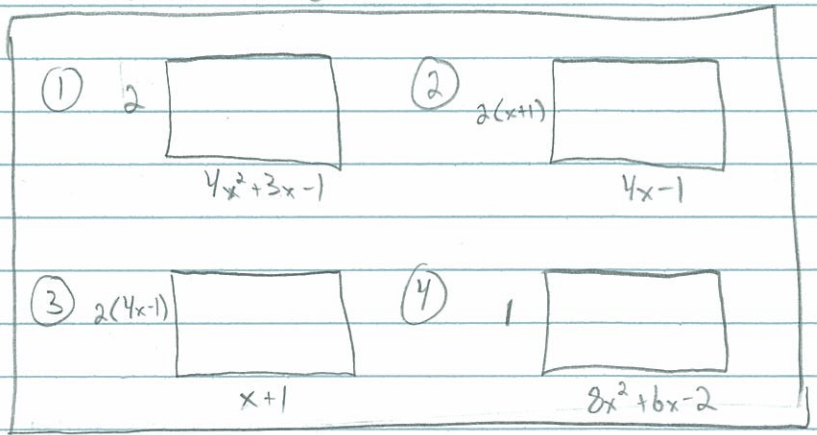
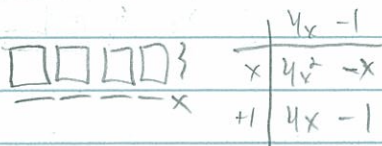


f)  $6a^2 - 10a - 16 = 2(3a^2 - 5a - 8) = 2(a+1)(3a-8)$



6. Area =  $8x^2 + 6x - 2 = 2(4x^2 + 3x - 1) = 2(x+1)(4x-1)$

∴ Possible Dimensions are:

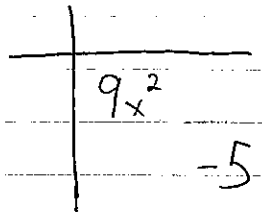


# M10-C CB - Factoring Symbolically Assignment KEY

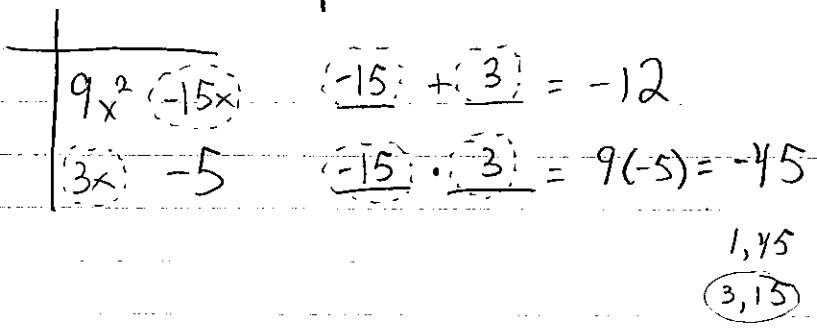
## 1. Explain a Process: Factoring Symbolically

Example: Factor  $9x^2 - 12x - 5$

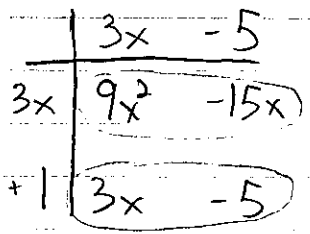
① Place the first and last term of the trinomial in a grid, according to standard form.



② Determine the two missing terms in the grid by finding numbers that have a sum equal to the middle term and the same product as the first and last term.



③ Determine the dimensions (factors) by factoring out a GCF from each row in the grid.



$(3x+1)(3x-5) = 9x^2 - 12x - 5$



2. Redo C3: #5 using factor symbolically.

a)  $2x^2 + 3x + 1 = (2x+1)(x+1)$       b)  $y^2 + 5yz + 6z^2 = (y+2z)(y+3z)$

	$x$	$+1$	
$2x$	$2x^2$	$2x$	$\underline{2} + \underline{1} = 3$
$+1$	$x$	$1$	$\underline{2} \cdot \underline{1} = 2$

	$y$	$+3z$	
$y$	$y^2$	$3yz$	$\underline{3} + \underline{2} = 5$
$+2z$	$2yz$	$6z^2$	$\underline{3} \cdot \underline{2} = 6$

c)  $r^2 + r - 110 = (r-10)(r+11)$

	$r$	$+11$	
$r$	$r^2$	$11r$	$\underline{11} + \underline{-10} = 1$
$-10$	$-10r$	$-110$	$\underline{11} \cdot \underline{-10} = -110$

d)  $4x^2 - 18xy - 10y^2 = 2(2x^2 - 9xy - 5y^2)$   
 $= 2(2x+5y)(x-5y)$

	$x$	$-5y$	
$2x$	$2x^2$	$-10xy$	$\underline{-10} + \underline{1} = -9$
$y$	$xy$	$-5y^2$	$\underline{-10} \cdot \underline{1} = -10$

e)  $3x^2 + 9x + 6 = 3x(x^2 + 3x + 2)$   
 $= 3x(x+1)(x+2)$

	$x$	$+2$	
$x$	$x^2$	$2x$	$\underline{2} + \underline{1} = 3$
$+1$	$x$	$2$	$\underline{2} \cdot \underline{1} = 2$

f)  $6a^2 + 10a - 16 = 2(3a^2 + 5a - 8)$   
 $= 2(a-1)(3a+8)$

	$3a$	$+8$	
$a$	$3a^2$	$8a$	$\underline{8} + \underline{-3} = 5$
$-1$	$-3a$	$-8$	$\underline{8} \cdot \underline{-3} = -24$

3.  $A = x^2 + 3x - 10$

$A = l \cdot w$

$A = (x-2)(x+5)$

$x-2$        $A = x^2 + 3x - 10$

$x+5$

	$x$	$+5$	
$x$	$x^2$	$5x$	$\underline{5} + \underline{-2} = 3$
$-2$	$-2x$	$-10$	$\underline{5} \cdot \underline{-2} = -10$

If  $x = 12\text{cm}$ , then  $w = x - 2$  and  $l = x + 5$   
 $= 12 - 2$        $= 12 + 5$

$w = 10\text{cm}$

$l = 17\text{cm}$

4. a)  $x^2 + 3x + 2 = (x+2)(x+1)$

b)  $x^2 + 5x + 6 = (x+3)(x+2)$

c)  $x^2 + 8x + 12 = (x+2)(x+6)$

d)  $s^2 + 3s - 10 = (s+5)(s-2)$

e)  $3m^2 - 21m + 30 = 3(m^2 - 7m + 10)$   
 $= 3(m-5)(m-2)$

f)  $f^2 - 7f + 6 = (f-6)(f-1)$

g)  $g^2 - 5g - 14 = (g-7)(g+2)$

h)  $a^2 - 3ab - 4b^2 = (a-4b)(a+b)$

i)  $2x^2 - 14x + 24 = 2(x^2 - 7x + 12)$   
 $= 2(x-4)(x-3)$

5. a)  $x^2 + 5x = x(x+5)$

b)  $y^2 - 3y - 18 = (y-6)(y+3)$

c)  $5x^2 + 13x - 6 = (5x-2)(x+3)$

d)  $3x^2 + 18x + 27 = 3(x^2 + 6x + 9)$   
 $= 3(x+3)(x+3)$  or  $3(x+3)^2$

	x	+3	
5x	5x <sup>2</sup>	15x	<u>15</u> + <u>2</u> = 13
-2	-2x	-6	<u>15</u> · <u>-2</u> = -30

e)  $x^2 + 8xy + 16y^2 = (x+4y)(x+4y)$   
 or  $(x+4y)^2$

f)  $3x^2y + 6xy = 3xy(x+2)$

g)  $2m^2 + 7mn + 3n^2 = (2m+n)(m+3n)$

h)  $4a^2 - 4a - 15 = (2a+3)(2a-5)$

	m	+3n	
2m	2m <sup>2</sup>	6mn	<u>6</u> + <u>1</u> =>
n	mn	3n <sup>2</sup>	<u>6</u> · <u>1</u> = 6

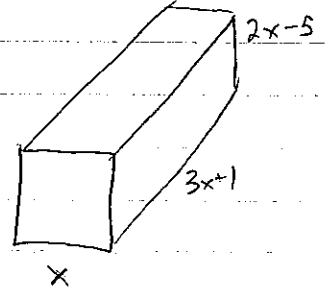
	2a	-5	
2a	4a <sup>2</sup>	-10a	<u>-10</u> + <u>6</u> = -4
+3	6a	-15	<u>-10</u> · <u>6</u> = -60

i)  $2x^2 + 8x - 42 = 2(x^2 + 4x - 21)$   
 $= 2(x+7)(x-3)$

$$b. \quad V = 6x^2 - 13x - 5 = x(6x^2 - 13x - 5) \\ = x(3x+1)(2x-5)$$

$$\begin{array}{l} l = x \\ w = 3x+1 \\ h = 2x-5 \end{array}$$

$$\begin{array}{r|l} 2x & -5 \\ \hline 3x & 6x^2 - 15x \quad \underline{-15 + 2 = -13} \\ +1 & 2x - 5 \quad \underline{-15 + 2 = -30} \end{array}$$



If  $x = 5\text{cm}$  then  $l = 5\text{cm}$  and  $V = 5(16)(5)$   
 $w = 3(5) + 1 = 16\text{cm}$   
 $h = 2(5) - 5 = 5\text{cm}$   
 $= 400\text{cm}^3$

$$\text{Dimensions} \rightarrow \begin{array}{l} l = 5\text{cm} \\ w = 16\text{cm} \\ h = 5\text{cm} \end{array} \quad \text{and} \quad V = 400\text{cm}^3$$

KEY

# M10-C Polynomials Review Assignment

1. 
$$\begin{array}{r} 2 \overline{) 204} \\ \underline{2 \ 102} \\ 51 \end{array} \quad 204 = \boxed{2 \cdot 2 \cdot 51}$$

2. a) 
$$\begin{array}{r} 5 \overline{) 30 \ 45} \\ \underline{3 \ 15 \ 9} \\ 2 \ 3 \end{array}$$

GCF = 15

b) 
$$\begin{array}{r} 2 \overline{) 84 \ 112} \\ \underline{2 \ 42 \ 56} \\ 7 \ 21 \ 28 \\ \underline{3 \ 4} \end{array}$$

GCF = 28

3. 
$$\begin{array}{r} 5 \overline{) 105 \ 120} \\ \underline{3 \ 21 \ 24} \\ 7 \ 8 \end{array}$$

$\frac{105}{120} = \frac{7}{8}$

4. 
$$\begin{array}{r} 5 \overline{) 30 \ 45} \\ \underline{3 \ 15 \ 9} \\ 2 \ 3 \end{array}$$

$$\begin{array}{r} 2 \overline{) 84 \ 112} \\ \underline{2 \ 42 \ 56} \\ 7 \ 21 \ 28 \\ \underline{3 \ 4} \end{array}$$

5. 
$$\begin{array}{r} 3 \overline{) 18 \ 27} \\ \underline{3 \ 6 \ 9} \end{array}$$

$$\frac{1}{18} + \frac{1}{27} = \frac{3}{54} + \frac{2}{54} = \frac{5}{54}$$

4. a)  $(x+8)(x-7) = x^2 - 7x + 8x - 56 = \boxed{x^2 + x - 56}$       b)  $(2y+3z)(4y+5z) = 8y^2 + 10yz + 12yz + 15z^2 = \boxed{8y^2 + 22yz + 15z^2}$

c)  $(2a+7)(2a-7) = 4a^2 - 14a + 14a - 49 = \boxed{4a^2 - 49}$       d)  $(2m-3)(2m-3) = 4m^2 - 6m - 6m + 9 = \boxed{4m^2 - 12m + 9}$

e)  $(x+3)(x^2-5x-8) = x^3 - 5x^2 - 8x + 3x^2 - 15x - 24 = \boxed{x^3 - 2x^2 - 23x - 24}$

f)  $-2(r-3s)(r+3s) = -2(r^2 + 3rs - 3rs - 9s^2) = -2(r^2 - 9s^2) = \boxed{-2r^2 + 18s^2}$

5. a)  $2x^2 + 10x = \boxed{2x(x+5)}$       b)  $x^3 + 6x^2 + 3x = \boxed{x(x^2 + 6x + 3)}$

c)  $27x^2y^5z - 81xy^3z + 45xy^4z = \boxed{9xy^3z(3xy^2 - 9 + 5y)}$

b. a)  $x^2 + 2x - 8 = \boxed{(x+4)(x-2)}$       b)  $x^2 - 5x + 6 = \boxed{(x-3)(x-2)}$

c)  $2x^2 - 10x + 12 = 2(x^2 - 5x + 6) = \boxed{2(x-3)(x-2)}$       d)  $4x^2 + 4x - 3 = \boxed{(2x-1)(2x+3)}$

	$2x + 3$	
$2x$	$4x^2 + 6x$	$6 + 2 = 4$
$-1$	$-2x - 3$	$6 \cdot 2 = -12$

e)  $x^2 - 6xy + 8y^2 = \boxed{(x-4y)(x-2y)}$       f)  $x^2 - x - 20 = \boxed{(x-5)(x+4)}$

g)  $9x^2 - 12x - 5 = \boxed{(3x+1)(3x-5)}$       h)  $8x^2 - 10x + 2 = 2(4x^2 - 5x + 1) = \boxed{2(4x-1)(x-1)}$

$3x$	$9x^2 - 15x$	$-5 + 3 = -12$
$+1$	$3x - 5$	$-15 \cdot 3 = -45$

	$x - 1$	
$4x$	$4x^2 - 4x$	$-4 + 1 = -5$
$-1$	$-x + 1$	$-4 \cdot 1 = -4$

$$i) -6x^2 + 15x - 81 = -3(2x^2 - 15x + 27) \\ = \boxed{-3(2x-9)(x-3)}$$

	$2x - 9$		
$x$	$2x^2 - 9x$	$\underline{-9} + \underline{-6} = -15$	1,54
$-3$	$-6x + 27$	$\underline{-9} \cdot \underline{-6} = 54$	2,27 3,18 6,9

$$7. a) s^2 - 64 = \boxed{(s+8)(s-8)}$$

$$b) d^2 - 121 = \boxed{(d+11)(d-11)}$$

$$c) 4h^2 - 25 = (2h+5)(2h-5)$$

$$d) 9m^2 - 81n^2 = \boxed{(3m+9n)(3m-9n)}$$

$$e) 144 - 4b^2 = 4(36 - b^2) \\ = \boxed{4(6+b)(6-b)}$$

$$f) 98c - 18cd^2 = 2c(49 - 9d^2) \\ = \boxed{2c(7+3d)(7-3d)}$$

$$8. a) b^2 + 14b + 49 = (b+7)(b+7) \\ = \boxed{(b+7)^2}$$

$$b) a^2 + 24ab + 144b^2 = (a+12b)(a+12b) \\ = \boxed{(a+12b)^2}$$

$$c) 9g^2 - 24g + 16 = \boxed{(3g-4)^2}$$

d) Perfect Square Trinomials

	$3g - 4$	
$3g$	$9g^2 - 12g$	$\underline{-12} + \underline{-12} = -24$
$-4$	$-12g + 16$	$\underline{-12} \cdot \underline{-12} = 144$

$$9. a) x^2 + 8x - 9 = \boxed{(x+9)(x-1)}$$

$$b) 4x^2y + 6xy = \boxed{2xy(2x+3)}$$

$$c) x^2 + 2xy - 120y^2 = \boxed{(x+12y)(x-10y)}$$

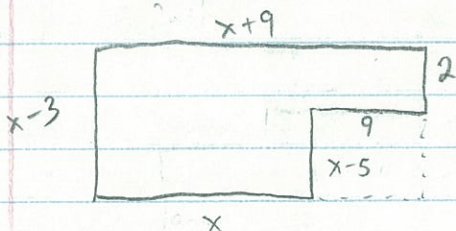
$$d) 6b^2 + 8b + 2 = 2(3b^2 + 4b + 1) \\ = \boxed{2(3b+1)(b+1)}$$

	$b + 1$	
$3b$	$3b^2 + 3b$	$\underline{3} + \underline{1} = 4$
$+1$	$b + 1$	$\underline{3} \cdot \underline{1} = 3$

e)  $16 - 4y^2 = 4(4 - y^2)$   
 $= 4(2+y)(2-y)$

f)  $3x^2 - 15x + 18 = 3(x^2 - 5x + 6)$   
 $= 3(x-3)(x-2)$

10.

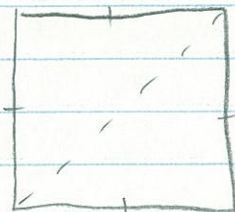


$A_{\text{entire rectangle}} = (x-3)(x+9)$   
 $= x^2 + 9x - 3x - 27$   
 $= x^2 + 6x - 27$

$A_{\text{missing rectangle}} = 9(x-5)$   
 $= 9x - 45$

Total Area =  $A_{\text{entire}} - A_{\text{missing}}$   
 $= (x^2 + 6x - 27) - (9x - 45)$   
 $= x^2 + 6x - 27 - 9x + 45$   
 $= x^2 - 3x + 18$

11.



$A = 9x^2 - 42x + 49 = (3x-7)(3x-7)$

$$\begin{array}{r|l} & 3x - 7 \\ 3x & 9x^2 - 21x \\ \rightarrow & -21x + 49 \end{array}$$

$\therefore$  side length of square  
 $= (3x-7)$

a) Perimeter =  $4(3x-7)$  ← factored form  
 $= 12x - 28$  ← simplified form

b) If  $x = 20\text{m}$ , then side length  
 $= 3(20) - 7 = 53\text{m}$ .

12.  $V = x^3 - 2x^2 - 3x$

$V = x(x^2 - 2x - 3)$

$V = x(x-3)(x+1)$   
 $l \quad w \quad h$

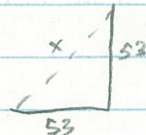


If  $x = 5\text{cm}$ ,  $l = 5\text{cm}$   
 $w = 2\text{cm}$   
 $h = 6\text{cm}$

Use this to determine diagonal

$x^2 = 53^2 + 53^2$

$x = 74.95$



Fence =  $4(53) + 74.95$   
 $= 287.0\text{m}$

*20*