Math 10-C Polynomials Assignment List   Name: _____

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
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Polynomials Chapter Review Assignment

Name_____

Adding and Subtracting Polynomials

Date_____ Period_____

Simplify each expression.

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

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

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

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

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

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

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

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

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

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

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

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

Name_____

Factoring Monomials

Date_____ Period____

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

1) $25n^2$

2) $18xy$

3) $12a$

4) $21y^2$

5) $81a$

6) $92q$

7) $36x^3$

8) $24h$

9) $48x^2$

10) $92xy$

11) $18x^2$

12) $50x$

M10C – Distributive Property Practice $C2$ Name: _____

Complete the following problems on a separate sheet of paper. No Calculators.

1. Multiply each of the following using all three multiplication strategies discussed in class (Grid, Rainbow & Classic)

    (a) 7 x 84   (b) 14 x 26

2. Multiply each of the following using the Rainbow method.

    (a) 6 x 162   (b) 32 x 25

3. Multiply each of the following using the Grid method.

    (a) 8 x 21   (b) 15 x 18   (c)   36 x 13

4. What multiplication sentence do the following grids represent? (___ x ___ = _____)

(a)

```
      |
 _____|_____
      |
      |  40   28
      |
```

(b)

```
      |
 _____|_____
      |
      | 100   60
      |
      |  50   30
      |
```

(c)

```
      |
 _____|_____
      |
      | 100    90
      |
      |  20    18
      |
```

(d)

```
      |
 _____|_____
      |
      | 200    70
      |
      | 100    35
      |
```

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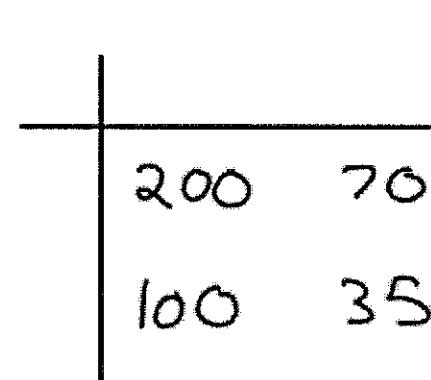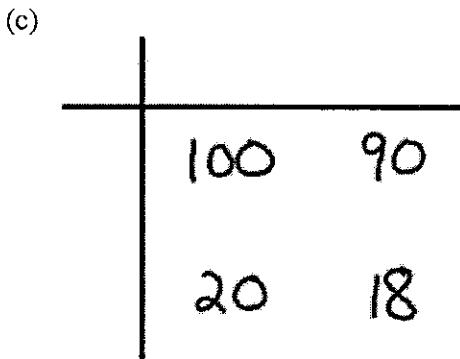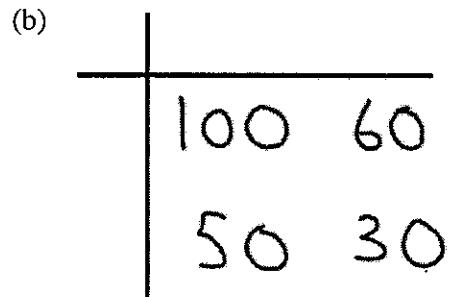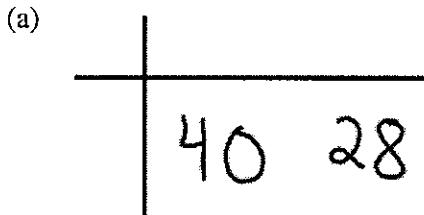
Why Is a Stick of Gum Like a Sneeze?

For each exercise, multiply the two polynomials. Find your answer in the set of answers under the exercise. Cross out the letter above your answer. When you finish, the answer to the title question will remain!

① $(x + 3)(x + 5)$

② $(x + 2)(x + 9)$

③ $(x − 8)(x + 1)$

④ $(x − 3)(x − 6)$

⑤ $(2x + 9)(x − 2)$

⑥ $(3x + 1)(2x + 4)$

⑦ $(4a − 7)(3a − 2)$

⑧ $(2a + 5)(2a − 5)$

⑨ $(6a − 1)(2a + 4)$

⑩ $(a + 2b)(4a + b)$

⑪ $(5a + 3b)(a − 4b)$

⑫ $(3a − 8b)(2a − b)$

⑬ $(n + 2)(n^2 + 5n − 3)$

⑭ $(3n − 1)(2n^2 + 4n + 4)$

⑮ $(2n + 3)(6n^2 − 2n + 1)$

⑯ $(4n − 5)(n^2 − 7n − 2)$

⑰ $(3n − 4)(4n^2 + 2n + 3)$

⑱ $(n + 8)(6n^2 − n − 4)$

Letter	Answer
B	$x^2 − 7x − 8$
E	$x^2 + 8x + 15$
S	$6x^2 + 14x + 4$
I	$6x^2 + 7x + 4$
A	$x^2 − 9x + 18$
U	$x^2 + 11x + 18$
T	$x^2 − 13x + 18$
N	$2x^2 + 5x − 18$
T	$4a^2 + 9ab + 2b^2$
I	$6a^2 − 19ab + 8b^2$
S	$5a^2 − 11ab − 12b^2$
E	$12a^2 + 22a − 4$
R	$4a^2 − 25$
A	$4a^2 + 4ab + 3b^2$
N	$5a^2 − 17ab − 12b^2$
O	$12a^2 − 29a + 14$
T	$6n^3 + 47n^2 − 12n − 32$
C	$6n^3 + 44n^2 − 9n − 32$
R	$4n^3 − 33n^2 + 27n + 10$
I	$6n^3 + 10n^2 + 8n − 4$
H	$n^3 + 6n^2 + 9n − 6$
E	$12n^3 − 9n^2 − 2n − 12$
A	$12n^3 − 10n^2 + n − 12$
N	$n^3 + 7n^2 + 7n − 6$
W	$4n^3 − 30n^2 + 21n + 10$
D	$12n^3 + 14n^2 − 4n + 3$

What Did the Girl Melon Say When the Boy Melon Proposed Marriage?

Circle the number-letter pair next to each TRUE statement below. Write the letter in the matching numbered box at the bottom of the page. (Hint: You should circle eight number-letter pairs in each column.)

3-S $(x+5)(x+2) = x^2+7x+10$

9-A $(t-7)(t-1) = t^2-8t+7$

6-L $(n-9)(n-3) = n^2-6n+27$

16-E $(u-3)(u+6) = u^2+3u-18$

6-T $(a+9)(a-8) = a^2+a-72$

7-R $(x+4)(x-10) = x^2-14x-40$

14-O $(3m+1)(m+5) = 3m^2+16m+5$

5-N $(8d+3)(2d+1) = 16d^2+14d+4$

7-I $(2k-4)(3k-2) = 6k^2-16k+8$

12-E $(x+8)(2x-6) = 2x^2+10x-48$

2-A $(4n-2)(n+5) = 4n^2+22n-10$

1-Y $(3v-2)(5v+4) = 15v^2+2v-8$

11-I $(2y+9)(3y-1) = 5y^2+25y-9$

5-U $(2w-6)(5w+4) = 10w^2-22w-24$

8-D $(8x-1)(4x+3) = 32x^2+24x-3$

11-T $(3x+2)(3x-2) = 9x^2-4$

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

15-A $(2c+6d)(c-d) = 2c^2+8cd-6d^2$

2-E $(4x-y)(3x+2y) = 12x^2+5xy-2y^2$

8-C $(2u-5v)(2u-8v) = 4u^2-26uv+40v^2$

10-P $(9a+b)(2a+5b) = 18a^2+47ab-5b^2$

13-R $(2a-2b)(a+10b) = 2a^2-8ab-20b^2$

15-P $(7m+n)(m-3n) = 7m^2-20mn-3n^2$

10-N $(x^2-4)(x^2-9) = x^4-13x^2+36$

3-D $(k^2-6)(k^2+3) = k^4-9k^2-18$

13-L $(x^2+2y)(x^2-2y) = x^4-4y^2$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

OBJECTIVE 3–g: To multiply binomials mentally.

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M10-C Polynomials   Name: _____

C3 – Factoring Polynomials Assignment #1

Complete the assignment on a separate sheet of paper.

1. Determine the greatest common factor (GCF) of the following pairs.
   (a) 25, 90   (b) 16, 64   (c) 24, 78   (d) 48, 60

2. Reduce each fraction to an equivalent fraction in lowest terms.
   (a) $\dfrac{18}{48} =$ (b) $\dfrac{27}{72} =$ (c) $\dfrac{32}{88} =$ (d) $\dfrac{340}{380} =$

3. Determine the greatest common factor (GCF) for each group of numbers.
   (a) 36, 54, 92   (b) 51, 66, 39   (c) 30, 45, 60

4. For each given polynomial area below:
   - Factor the polynomial.
   - Sketch a rectangle to show the polynomial area and dimensions.
   - Use grid multiplication to check the answer.

   Polynomial Areas
   a) $7x + 49$ d) $4x^2 - 20x$ g) $-3x^3 + 6x^2 - 9x$
   b) $6x^2 + 24x$ e) $3x + 9xy + 6xz$ h) $-12x^2y^2 + 3xy^3 - 15x^3y$
   c) $8x - 40$ f) $3ax + 3ay$ i) $x(x - 3) + 2(x - 3)$

   Example
   Rectangular Polynomial Area = 5x + 35

   Factored Polynomial Area: 5(x+7)

   Rectangle Sketch: *Check:*
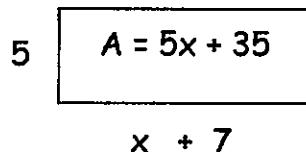
   $$5 \;\boxed{A = 5x + 35}$$
   $$x + 7$$

	x	$+$	7
5	5x	+	35

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Rectangles and Algebra Tiles #1

Polynomial	Sketch of Rectangle	Grid	Dimensions (factors)
$2x^2 + 5x + 3$			
$x^2 + 5x + 6$			
$3x^2 + 4x + 1$			
$2x^2 + 7x + 6$			
$x^2 + 7x + 12$			

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$3x^2+8x+4$			
$2x^2+7x+5$			
$2x^2+25x+12$			
$2x^2+7x+3$			
$2x^2+11x+12$			

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Polynomial	Sketch of Rectangle	Grid	Factors
	■ | | — ● ●		
$2x^2+3x+1$			
		$\begin{array}{c\|cc} & 3x & +2 \\ \hline x & 3x^2 & 2x \\ +3 & 9x & 6 \end{array}$	
			$(x+3)(x+5)$
		$\begin{array}{c\|cc} & 2x & +3 \\ \hline x & 2x^2 & 3x \\ +3 & 6x & 9 \end{array}$	

$3x^2+13x+4$			
			$(5x+3)(x+2)$
$5x^2+8x+3$			
$8x^2+18x+9$			

Polynomial	Sketch of Rectangle	Grid	Factors
	▢ ‖‖‖) ⌇ x x x x x		
x^2-8x+7			
		$\begin{array}{c\|cc} & 2x & +3 \\ \hline x & 2x^2 & +3x \\ -1 & -2x & -3 \end{array}$	
			$(x-5)(x-2)$
$2x^2-9x+9$			

$3x^2-x-4$			
	(algebra tile drawing: 2 squares, 6 vertical lines, 2 rows of squiggles and x marks)		
			$(5x-3)(x+2)$
$2x^2-5x-12$			
$3x^2-14x+8$			
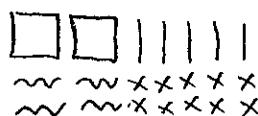
1. State the trinomial represented by each rectangle of algebra tiles. Then, determine the dimensions of each rectangle.
   (Note: shaded is positive, un-shaded is negative)

   a)   b)   c)   d)
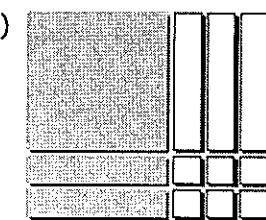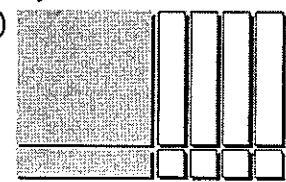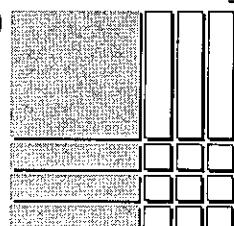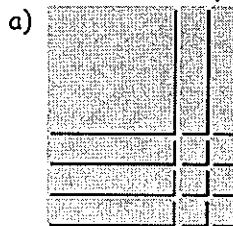
2. Fully factor the following polynomials.

   a) $2x^2 + 5x + 3$

   b) $3x^2 + 7x + 4$

   c) $x^2 - 5x + 6$

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

   e) $3x^2 + 7x - 6$

   f) $2m^2 + 3m - 9$

   g) $4x^2 - 11x + 6$

   h) $2x^2 + 5x - 12$

   i) $y^2 - y - 6$

3. Fully factor the following polynomials.

   a) $2x^2 + 14x + 20$

   b) $2g^2 - 10g - 28$

   c) $3b^2 - 9b - 12$

   d) $8m^2 - 28m - 36$

   e) $w^3 + 10w^2 + 25w$

   f) $6x^2y + 2xy - 4y$

4. Fully factor the following polynomials.

   a) $x^2 + 2xy + y^2$

   b) $2x^2 + xy - 6y^2$

   c) $3a^2 + 13ab + 4b^2$

   d) $x^2 + 12xy + 36y^2$

   e) $2f^2 - 14fg + 24g^2$

   f) $6x^2 - 9xy - 15y^2$

5. Fully factor the following polynomials.

   a) $2x^2 + 3x + 1$

   b) $y^2 + 5yz + 6z^2$

   c) $r^2 + r - 110$

   d) $4x^2 - 18xy - 10y^2$

   e) $3x^3 + 9x^2 + 6x$

   f) $6a^2 + 10a - 16$

6. Determine all the possible dimensions of the following rectangle:

   Area $= 8x^2 + 6x - 2$

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C3 - Factoring Symbolically Assignment

1. Factor $9x^2 - 12x - 5$ symbolically. Show me your solution.

2. Redo questions #2*ace* and #5 from the *C3 Factoring Concretely & Pictorially Assignment* by using a symbolic strategy.

3. Determine the binomials that represent the width and length of the rectangle shown. Then, calculate the dimensions if x = 12 cm.

   Area $= x^2 + 3x - 10$
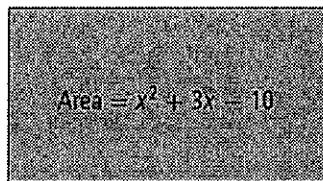
4. Completely factor the following polynomials by inspection.
   a) $x^2 + 3x + 2$
   b) $x^2 + 5x + 6$
   c) $x^2 + 8x + 12$

   d) $s^2 + 3s - 10$
   e) $3m^2 - 21m + 30$
   f) $f^2 - 7f + 6$

   g) $g^2 - 5g - 14$
   h) $a^2 - 3ab - 4b^2$
   i) $2x^2 - 14x + 24$

5. Completely factor the following polynomials.
   a) $x^2 + 5x$
   b) $y^2 - 3y - 18$
   c) $5x^2 + 13x - 6$

   d) $3x^2 + 18x + 27$
   e) $x^2 + 8xy + 16y^2$
   f) $3x^2y + 6xy$

   g) $2m^2 + 7mn + 3n^2$
   h) $4a^2 - 4a - 15$
   i) $2x^2 + 8x - 42$

6. A rectangular prism has the volume as shown. Determine expressions for the dimensions of the rectangular prism. If x = 5 cm, calculate the dimensions and the volume of the prism.

   $V = 6x^3 - 13x^2 - 5x$

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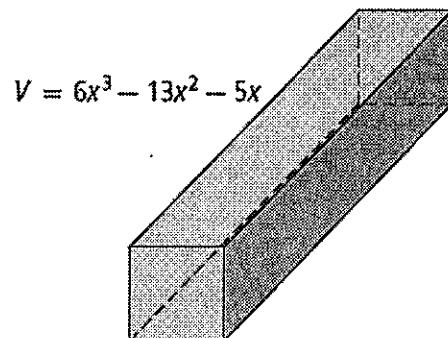
M10-C Polynomials Review Assignment   Name: _____

Complete all problems on a separate sheet of paper.

1. Determine the prime factorization of 204.

2. Determine the GCF of each set of terms.
   a) 30 and 45   b) 84 and 112

3. Write $\dfrac{105}{120}$ as a simplified fraction in lowest terms.

4. Determine the product and then simplify by combining like terms.
   a) $(x+8)(x-7)$ b) $(2y+3z)(4y+5z)$ c) $(2a+7)(2a-7)$

   d) $(2m-3)^2$ e) $(x+3)(x^2-5x-8)$ f) $-2(r-3s)(r+3s)$

5. Completely factor the following polynomials, if possible.
   a) $2x^2+10x$ b) x^3+6x^2+3x c) $27x^2y^5z-81xy^3z+45xy^4z$

6. Completely factor the following polynomials, if possible.
   a) x^2+2x-8 b) x^2-5x+6 c) $2x^2-10x+12$

   d) $4x^2+4x-3$ e) $x^2-6xy+8y^2$ f) x^2-x-20

   g) $9x^2-12x-5$ h) $8x^2-10x+2$ i) $-6x^2+45x-81$

7. Completely factor the following polynomials, if possible.
   a) s^2-64 b) d^2-121 c) $4h^2-25$

   d) $9m^2-81n^2$ e) $144-4b^2$ f) $98c-18cd^2$

8. Completely factor the following polynomials, if possible.
   a) $b^2+14b+49$ b) $a^2+24ab+144b^2$ c) $9g^2-24g+16$

   d) What is special about the trinomials in a), b), and c) above?

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9. Completely factor the following polynomials, if possible.

a) $x^2 + 8x - 9$ b) $4x^2y + 6xy$ c) $x^2 + 2xy - 120y^2$

d) $6b^2 + 8b + 2$ e) $16 - 4y^2$ f) $3x^2 - 15x + 18$

10. Write a simplified expression to represent the area.

$x + 9$

$x - 3$

2

$x - 5$ 9

x
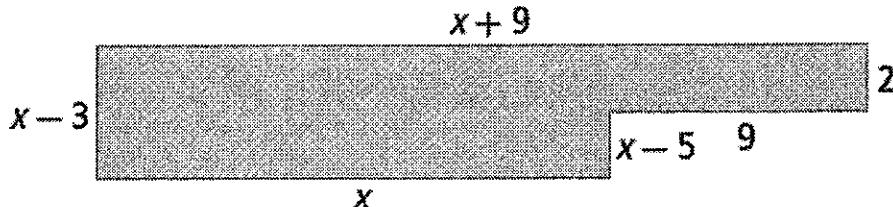
11. The expression for a square field's area is as shown in the diagram. A fence borders the field, and also partitions it in half by running diagonally from corner to corner.

a) Determine an expression for the perimeter of the field in simplified form and in factored form.

b) If x = 20 m, what is the length of the fence, to the nearest tenth of a metre?
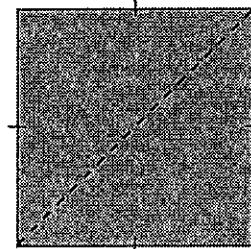
Area $= 9x^2 - 42x + 49$

12. Given the volume of the rectangular prism as shown in the diagram, write the algebraic expressions that represent its dimensions. Then, calculate the dimensions of the rectangular prism if x = 5 cm.

Volume $= x^3 - 2x^2 - 3x$

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