



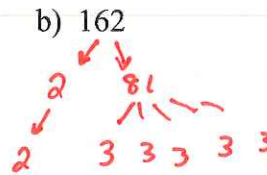
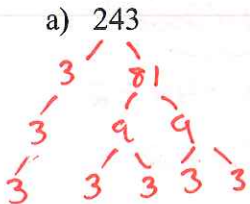
# Math 10C – Polynomials

## Review

Name: Key!

Date: \_\_\_\_\_

1. Write each number as a product of its prime factors by using a factor tree.



243 =  $(3)(3)(3)(3)(3)$  or  $3^5$

162 =  $(2)(3)(3)(3)(3)$

2. What is the greatest common factor (GCF) of each set of numbers?

a) 243 and 162

1, 3,  
1, 2

81, 243  
81, 162

81 = GCF

b) 192 and 216

1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 64, 96, 192  
1, 2, 3, 4, 6, 8, 12, 18, 24, 36, 54, 72, 108, 216

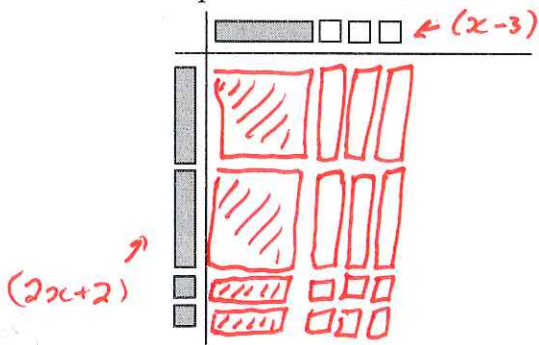
72 = GCF

3. Determine the least common multiple (LCM) of 12 and 26.

12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132, 144, 156  
26, 52, 78, 104, 130, 156, 182, 208

LCM = 156

4. Complete the following multiplication using algebra tiles. State the polynomial that it represents in factored form and in expanded form.

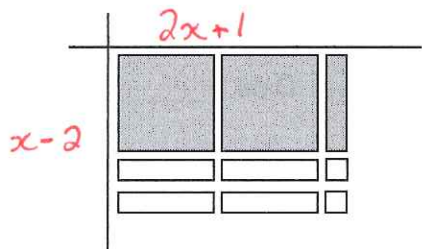


Factored form  $\rightarrow (x-3)(2x+2)$

expanded form  $\rightarrow 2x^2 - 4x - 6$

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5. Bill was given the following polynomial represented by the algebra tiles below.



- State the factors that represent the polynomial.

$$(x-2)(2x+1)$$

- State the area of the polynomial in simplified form.

$$2x^2 - 3x - 2$$

$$\begin{aligned} & (x-2)(2x+1) \\ &= 2x^2 + x - 4x - 2 \\ &= 2x^2 - 3x - 2 \end{aligned}$$

5. Multiply the following. Simplify your answers.

a)  $(x-3)(x-5)$

$$\begin{aligned} &= x^2 - 5x - 3x + 15 \\ &= x^2 - 8x + 15 \end{aligned}$$

b)  $(2x+5)(3x-6)$

$$\begin{aligned} &= 6x^2 - 12x + 15x - 30 \\ &= 6x^2 + 3x - 30 \end{aligned}$$

c)  $(4-3a)(4+3a)$

$$\begin{aligned} &= 16 + 12a - 12a - 9a^2 \\ &= -9a^2 + 16 \end{aligned}$$

d)  $(x-7)^2$

$$\begin{aligned} &= (x-7)(x-7) \\ &= x^2 - 7x - 7x + 49 \\ &= x^2 - 14x + 49 \end{aligned}$$

e)  $(2x+3)^2$

$$\begin{aligned} &= (2x+3)(2x+3) \\ &= 4x^2 + 6x + 6x + 9 \\ &= 4x^2 + 12x + 9 \end{aligned}$$

f)  $2(3x-1)(x+2)$

$$\begin{aligned} &= (6x-2)(x+2) \\ &= 6x^2 + 12x - 2x - 4 \\ &= 6x^2 + 10x - 4 \end{aligned}$$

6. Use the distributive property to determine each product.

a)  $3a(a^2+3a-5)$

$$= 3a^3 + 9a^2 - 15a$$

b)  $(x+2)(x^2-2x+5)$

$$\begin{aligned} &= x^3 - 2x^2 + 5x + 2x^2 - 4x + 10 \\ &= x^3 + 1x + 10 \end{aligned}$$

11. Factor each trinomial. First check for a GCF.

a)  $4x^2 + 24x + 36$   
 $= 4(x^2 + 6x + 9)$   
 $= 4(x+3)(x+3)$  or  $4(x+3)^2$

b)  $3x^2 - 30x + 63$   
 $= 3(x^2 - 10x + 21)$   
 $= 3(x-7)(x-3)$

12. Factor using decomposition.

a)  $2x^2 + 13x + 15$       Prod = +30      15 40 and +3  
    Sum = +13  
 $= 2x^2 + 10x + 3x + 15$   
 $= 2x(x+5) + 3(x+5)$   
 $= (2x+3)(x+5)$

b)  $9x^2 + 3x - 2$       Prod = -18      -6 and +3  
    Sum = +3  
 $= 9x^2 - 18x + 3x - 2$   
 $= 9x(3x-2) + 1(3x-2)$   
 $= (9x+1)(3x-2)$

13. Factor each binomial completely, if possible. Remember to check for a GCF.

a)  $y^2 - 121$   
 $= (y-11)(y+11)$

b)  $25x^2 - y^2$   
 $= (5x-y)(5x+y)$

c)  $9x^3 - 36x$   
 ~~$= 9x^2$~~   $= x(9x^2 - 36)$   
 $= x(3x-6)(3x+6)$

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7. Multiply. Then, combine like terms.

a)  $(x-2)(x-3) - (x-4)$

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

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

b)  $(x-1)(x-2) + (x+3)(x+2)$

$$= x^2 - 2x - 1x + 2 + x^2 + 2x + 3x + 6$$

$$= 2x^2 + 2x + 8$$

8. State the GCF of each set of terms.

a)  $15x^4$  and  $5x^2y$        $GCF = 5x^2$

b)  $18y^4$ ,  $-9y^3$ , and  $-27y^2$        $GCF = 9y^2$

9. Factor each polynomial, if possible.

a)  $6x^2 + 24x$

$$= 6x(x+4)$$

b)  $24abc - 6ab + 8bc$

$$= 2b(12ac - 3a + 4c)$$

c)  $-12x^2y^2 + 3xy^3 - 15x^3y$

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

d)  $3x(a+b) - 5(a+b)$

$$= (3x-5)(a+b)$$

10. Factor, if possible.

a)  $x^2 + 8x + 15$

$$= (x+3)(x+5)$$

b)  $x^2 - x - 20$

$$= (x-5)(x+4)$$

c)  $x^2 - 13x + 42$

$$= (x-7)(x-6)$$



14. The area of a rectangle can be represented by the trinomial  $3x^2 + 10x - 8$ .

+12 and  
-2

Prod = -24  
Sum = +10

$$3x^2 + 10x - 8$$

- Factor  $3x^2 + 10x - 8$  to find expressions to represent the dimensions of the rectangle.

$$= 3x^2 + 12x - 2x - 8$$

$$= 3x(x+4) - 2(x+4)$$

$$= (3x-2)(x+4)$$

$$\text{Length} = \underline{3x-2}$$

$$\text{Width} = \underline{x+4}$$

either  
order  
is  
fine!

- If  $x$  represents 5 cm, what are the length and width of the rectangle?

$$\text{Length} = 3(5) - 2 = 13 \text{ cm}$$

$$\text{Width} = (5) + 4 = 9 \text{ cm}$$

either order is fine.

15. Andrew multiplied the expression  $(2x-4)(3x+5)$  and got an answer of  $6x^2 - 2x + 20$ .

- Verify Andrew's work by substituting in  $x = 4$  into the factors and the answer.

$$(2(4)-4)(3(4)+5) = 68$$

$$6(4)^2 - 2(4) + 20 = 108$$

- Was Andrew's work correct? Explain how you know.

No! The solutions to the checks did not match!

