

Final Exam Review Factors and Products

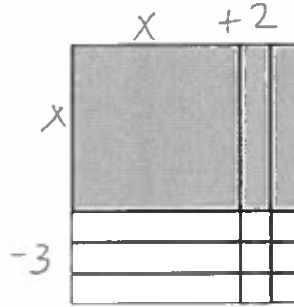
Section One: Circle the correct solution.

1. For the expression  $x^2 - \boxed{?}x - 12$  to be factorable, give the value for  $\boxed{?}$ .
- (A) 2                      (B) 3                      (C) 4                      (D) 6

12, 1  
3, 4  
-6+2

2. A polynomial is represented by the tiles shown below. What are the factors of the polynomial? (Consider the shaded tiles positive!!)

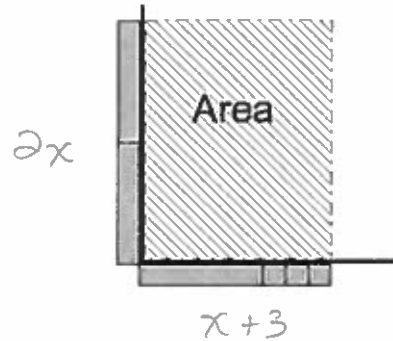
- (A)  $(x + 3)(x - 2)$   
 (B)  $(x + 3)(x + 2)$   
 (C)  $(x - 3)(x - 2)$   
 (D)  $(x - 3)(x + 2)$



3. Two students set up some algebra tiles to help model a product. Which expression represents the modeled area? (Shaded tiles are positive)

- (A)  $x^2 + 6x$   
 (B)  $2x^2 + 3x$   
 (C)  $x^2 + 3x$   
 (D)  $2x^2 + 6x$

$2x(x+3)$   
 $2x^2 + 6x$



4. Multiply:  $(2x - 3)(3x + 4)$ .  $= 6x^2 + 8x - 9x - 12 = 6x^2 - x - 12$

- (A)  $6x^2 - x - 12$                       (B)  $6x^2 - 12$   
 (C)  $6x^2 - 17x - 12$                       (D)  $6x^2 + 2x - 12$

5. A rectangle has dimensions  $(2x - 3)$  and  $(3x + 1)$ . Find the area of the rectangle.

- (A)  $5x - 2$                       (B)  $6x^2 - 7x - 3$   
 (C)  $6x^2 + 7x - 3$                       (D)  $5x^2 - 7x - 3$

$(2x-3)(3x+1)$   
 $= 6x^2 + 2x - 9x - 3$   
 $= 6x^2 - 7x - 3$

6. Which is the product of  $(x + 3)$  and  $(3x - 2)$ ?

- (A)  $3x^2 - 6$                       (B)  $4x^2 - 6$   
 (C)  $3x^2 + 7x - 6$                       (D)  $4x^2 + 7x - 6$

$(x+3)(3x-2)$   
 $3x^2 - 2x + 9x - 6$   
 $3x^2 + 7x - 6$

7. The area of a rectangle is  $x^2 - 2x - 24$ . What are the dimensions?

- (A)  $(x + 4)$  by  $(x - 6)$                       (B)  $(x - 4)$  by  $(x + 6)$   
 (C)  $(x + 4)$  by  $(x + 6)$                       (D)  $(x - 4)$  by  $(x - 6)$

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

8. Factor completely:  $4x^2 - 25$   $(2x-5)(2x+5)$   
 (A)  $(4x-25)(4x+25)$   
 (B)  $(2x-5)(2x-5)$   
 (C)  $(2x-5)(2x+5)$   
 (D)  $(2x+5)(2x+5)$

9. Factor completely:  $2x^2 + 4x - 6$   $2(x^2 + 2x - 3)$   
 (A)  $(x+3)(x-1)$   
 (B)  $(2x-2)(x+3)$   
 (C)  $2(x^2 + 2x - 3)$   
 (D)  $2(x-1)(x+3)$

10. Expand and simplify:  $(x+2)(2x^2 - x + 5)$   $= 2x^3 - x^2 + 5x + 4x^2 - 2x + 10$   
 (A)  $2x^3 + 3x^2 + 3x + 10$   
 (B)  $2x^3 - x^2 + 5x + 10$   
 (C)  $2x^3 + 5x^2 + 7x + 10$   
 (D)  $2x^3 + 3x^2 + 7x + 10$

**Section Two: Answer all questions. You MUST show your work to get full credit.**

1. Expand and simplify using the method of your choice.  
 (A)  $(2x-1)(x+3) - (3x+2)(2x+5)$   
 (B)  $(x^2 - 2x + 5)(2x^2 + 4x - 1)$

1. A.  $(2x^2 + 6x - x - 3) - (6x^2 + 15x + 4x + 10)$   
 $(2x^2 + 5x - 3) - (6x^2 + 19x + 10)$   
 $2x^2 + 5x - 3 - 6x^2 - 19x - 10$   
 $-4x^2 - 14x - 13$

2. Factor fully each of the following expressions:

(A)  $x^2 - 5x - 14$

$(x-7)(x+2)$

(B)  $8x^2 + 10x - 3 = 8x^2 + 12x - 2x - 3$

$= 4x(2x+3) - 1(2x+3)$

(C)  $6x^2 - xy - 2y^2$

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

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

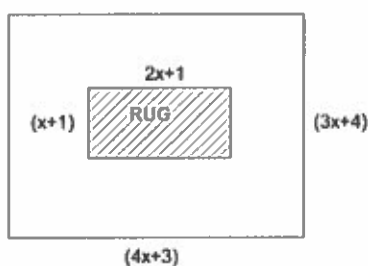
(D)  $81x^4 - 16y^4$

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

1B.  $2x^4 + 4x^3 - x^2 - 4x^3 - 8x^2 + 2x + 10x^2 + 20x - 5$   
 $2x^4 + x^2 + 22x - 5$

3. The shaded region represents a picture frame. Find an expression for

the area of the shaded region in simplest form.



$A_{\text{SHADED}} = A_{\text{LG}} - A_{\text{SM}}$

$A_{\text{LG}} = L \times W$

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

$= 12x^2 + 9x + 16x + 12$

$= 12x^2 + 25x + 12$

$A_{\text{SM}} = L \times W$

$= (x+1)(2x+1)$

$= 2x^2 + x + 2x + 1$

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

$A_{\text{SHADED}} = (12x^2 + 25x + 12) - (2x^2 + 3x + 1)$

$= 12x^2 + 25x + 12 - 2x^2 - 3x - 1$

$= 10x^2 + 22x + 11$