

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

Unit 2 Factors and Products Practice Test

1. Expand and simplify each expression.

a)  $-2a^4(7a^3c^5)$   
 $-14a^7c^9$

b)  $(r+11)(r-6)$

$$r^2 - 6r + 11r - 66$$

$$r^2 + 5r - 66$$

c)  $2(x+3)(x+5)$

$$2[x^2 + 5x + 3x + 15]$$

$$2[x^2 + 8x + 15]$$

$$2x^2 + 16x + 30$$

d)  $(2x+5)^2$

$$(2x+5)(2x+5)$$

$$4x^2 + 10x + 10x + 25$$

$$4x^2 + 20x + 25$$

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

$$x + 2[3x^2 + x - 3x - 1]$$

$$x + 2[3x^2 - 2x - 1]$$

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

$$6x^2 - 3x - 2$$

g)  $3 - 7(x+4) + 4(1-5x)$

$$3 - 7x - 28 + 4 - 20x$$

$$-27x - 21$$

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

$$2x - 4x^2 - 3 + 6x - (x - 3)$$

$$-4x^2 + 8x - 3 - x + 3$$

$$-4x^2 + 7x$$

h)  $3y(y^2 - y - 1) - 2y(3y^2 - 6)$

$$3y^3 - 3y^2 - 3y - (6y^3 - 12y)$$

$$3y^3 - 3y^2 - 3y - 6y^3 + 12y$$

$$-3y^3 - 3y^2 + 9y$$

2. Factor each polynomial

a)  $9a^2 + 12a^3$

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

GCF =  $3a^2$

b)  $3x^2 + 6x^4$

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

GCF =  $3x^2$

c)  $25x^3y + 15x^4y^3 - 30x^2y^2$

$5x^2y(5x + 3x^2y^2 - 6y)$

GCF =  $5x^2y$

d)  $-4r^2s^2 + 12r^2s^3 - 36rs^2$

$-4rs^2(r - 3rs + 9)$

GCF =  $-4rs^2$

3. Factor each trinomial

a)  $t^2 + 10t + 21$

$(t + 7)(t + 3)$

$\begin{matrix} \underline{-}x \underline{-} = 21 \\ \underline{+7} + \underline{+3} = 10 \end{matrix}$

b)  $m^2 - 11m + 24$

$(m - 8)(m - 3)$

$\begin{matrix} \underline{-}x \underline{-} = 24 \\ \underline{-8} + \underline{-3} = -11 \end{matrix}$

c)  $x^2 - 12x + 35$

$(x - 7)(x - 5)$

$\begin{matrix} \underline{-}x \underline{-} = 35 \\ \underline{-7} + \underline{-5} = -12 \end{matrix}$

d)  $-4x^2 - 16x + 128$

$-4(x^2 + 4x - 32)$

$-4(x + 8)(x - 4)$

GCF =  $-4$

$\begin{matrix} \underline{-}x \underline{-} = -32 \\ \underline{+8} + \underline{-4} = 4 \end{matrix}$

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

$3x^2 + 6x - 1x - 2$   
 $3x(x + 2) - 1(x + 2)$   
 $(x + 2)(3x - 1)$

Decomp  
 $\begin{matrix} \underline{-}x \underline{-} = -6 \\ \underline{+2} + \underline{-1} = 5 \end{matrix}$

f)  $6x^2 - 7x - 10$

$6x^2 - 12x + 5x - 10$   
 $6x(x - 2) + 5(x - 2)$   
 $(x - 2)(6x + 5)$

$\begin{matrix} \underline{-}x \underline{-} = -60 \\ \underline{-12} + \underline{+5} = -7 \end{matrix}$

- GCF = 3

g)  $6x^2 - 21x + 9$

$3(2x^2 - 7x + 3)$   $\frac{-x}{-6} = \frac{-}{1} = -6$   
 $\frac{-x}{-6} + \frac{-}{1} = -7$   
 $3[2x^2 - 6x - 1x + 3]$   
 $3[2x(x-3) - 1(x-3)]$   
 $3(x-3)(2x-1)$

GCF = 2

h)  $24m^2 - 2m - 70$

$2(12m^2 - m - 35)$   
 $2[12m^2 + 20m - 21m - 35]$   $\frac{20}{20} + \frac{-21}{-21} = -1$   
 $2[4m(3m+5) - 7(3m+5)]$   
 $2(3m+5)(4m-7)$

4. Replace each  $\blacksquare$  with a number that will a trinomial that can be factored

	Product	Sum
a) $x^2 + \blacksquare x + 6$	$-1 \times -6 = 6$	$-7$
	$-2 \times -3 = 6$	$-5$
	$2 \times 3 = 6$	$5$
	$1 \times 6 = 6$	$7$

	Product	Sum
b) $x^2 + \blacksquare x - 12$	$-1 \times 12 = -12$	$11$
	$1 \times -12 = -12$	$-11$
	$2 \times -6 = -12$	$-4$
	$-2 \times 6 = -12$	$4$
	$-3 \times 4 = -12$	$-1$

c) $w^2 - \blacksquare w + 24$	$-1 \times 24$	$-23$
	$-2 \times 12$	$-14$
	$-3 \times 8$	$-11$
	$-4 \times 6$	$-10$

d) $x^2 - \blacksquare x - 18$	$3 \times -4 = -12$	$-1$
	$1 \times -18$	$-17$
	$2 \times -9$	$-7$
	$3 \times -6$	$-3$
	$-1 \times 18$	$17$
	$-2 \times 9$	$7$
	$-3 \times 6$	$3$

5. Identify each polynomial as a perfect square trinomial, difference of squares, or other. Justify your answer.

a)  $25x^4 - 26y^2$  Neither

$\sqrt{26}$  is Not a perfect square.

b)  $4a^2 + 20a + 25$  Perfect Square  
 $\sqrt{4a^2} = 2a$   
 $\sqrt{25} = 5$   
 $2(2a)(5) = 20a$

6. Factor each polynomial. Identify each polynomial as a perfect square trinomial or a difference of squares.

a)  $x^2 - 64$  Diff of Squares  
 $(x-8)(x+8)$

b)  $121x^2 - 100y^2$  Diff of Squares  
 $(11x-10y)(11x+10y)$

$$c) 5w^4 - 80$$

$$5(w^4 - 16)$$

$$5(w^2 - 4)(w^2 + 4)$$

$$5(w - 2)(w + 2)(w^2 + 4)$$

$$e) 121m^2 - 22m + 1$$

$$(11m - 1)(11m - 1)$$

or

$$(11m - 1)^2$$

$$d) 9a^2 + 48a + 64$$

$$(3a + 8)(3a + 8)$$

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

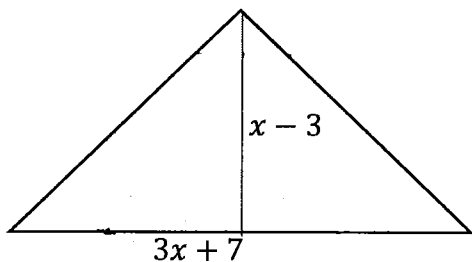
$$f) 4 + 28r + 49r^2$$

$$(2 + 7r)(2 + 7r)$$

$$(2 + 7r)^2$$

7. Determine the area of the triangle

Area of a triangle  $A = \frac{1}{2}(\text{base})(\text{height})$

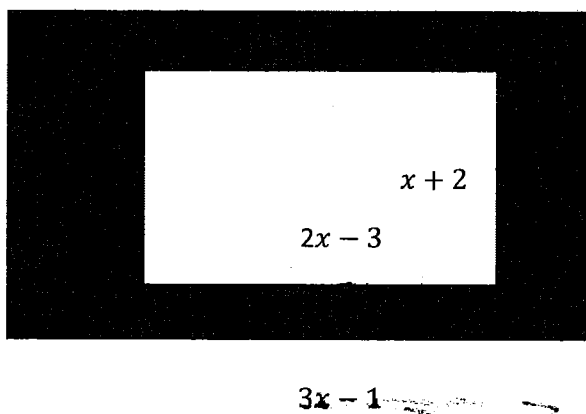


$$A = \frac{(3x + 7)(x - 3)}{2}$$

$$A = \frac{3x^2 - 9x + 7x + 21}{2}$$

$$A = \frac{3x^2 - 2x + 21}{2}$$

8. Find the area of each rectangle. Write a polynomial that represents the shaded area.



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

$$S_m = 2x^2 - 3x + 4x - 6$$

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

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

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

$$= 3x^2 + 11x - 4$$

$$\text{Area} = L_g - S_m$$

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

$$= 3x^2 + 11x - 4 - 2x^2 - x + 6 = x^2 + 10x + 2$$