

Review for Test #12 - Polynomials and Factoring

Name: _____ Period: _____ Date: _____

- 1.) Write the following expressions in descending order. Then, indicate the **degree** of the expression. *highest exponent → lowest exponent*

a.) $12x^7 + 9x - 3 + 2x^9 + 8x^3$
 $2x^9 + 12x^7 + 8x^3 + 9x - 3$

b.) $18x^4 - 9x^6 + 12 - 4x$
 $-9x^6 + 18x^4 - 4x + 12$

- 2.) Write an *example* of each of the following vocabulary words.

a.) Monomial

$5x$

b.) Binomial

$3x^2 + 7x$

c.) Trinomial

$2x^2 - 5x + 1$

Simplify:

3.) $(3x^2y + 2xy - 9xy^2) + (4x^2y - 7xy + 13xy^2)$ 4.) $(7x^2 + 4) + (x^2 - 2x - 4)$

$7x^2y - 5xy + 4xy^2$

$8x^2 - 2x + 0$
 $8x^2 - 2x$

5.) $(3x^2y + 2xy - 9xy^2) - (4x^2y - 7xy + 13xy^2)$ 6.) $(7x^2 + 4) - (x^2 - 2x - 4)$

$3x^2y + 2xy - 9xy^2 - 4x^2y + 7xy - 13xy^2$
 $-x^2y + 9xy - 22xy^2$

$7x^2 + 4 - x^2 + 2x + 4$
 $6x^2 + 2x + 8$

7.) $(a^3b^4c)(ab^{-2}c^{13})$ Add exponents

$a^4b^2c^{14}$
 $a: 3+1=4$
 $b: 4-2=2$
 $c: 1+13=14$

8.) $k^2d(2c^4d^2 + 9cd^3 - 8de)$
 $2c^6d^3 + 9c^3d^4 - 8c^2d^2e$

9.) $(12x^9)^2$
 $(12x^9)(12x^9)$
 $144x^{18}$

10.) $-5x(4x^2 - 8x + 3)$
 $-20x^3 + 40x^2 - 15x$

11.) $(5r^8)^3$

$5^3 = 125$ (coefficient)
 $8 \cdot 3 = 24$

$(5r^8)(5r^8)(5r^8) = 125r^{24}$

12.) $(4^9)^5$

4^{45}

$9 \cdot 5 = 45$
 base stays

13.) $5^4 \cdot 5^9$

5^{13}

$4 + 9 = 13$

14.) $\frac{2^9}{2^3}$ $9 - 3 = 6$

2^6

15.) $\frac{c^7}{c^4}$ c^3

$7 - 4 = 3$

16.) $\frac{-12n^4 - 21n^3 + 3n^2}{-3n^2}$
 $4n^2 + 7n - 1$

17.) $(x+2)(x-8)$

$x^2 - 8x + 2x - 16$

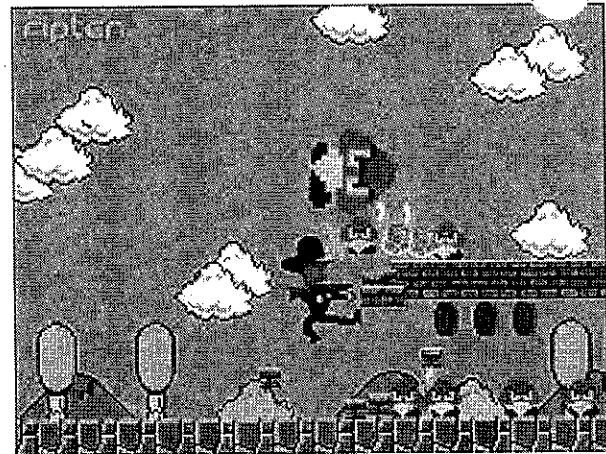
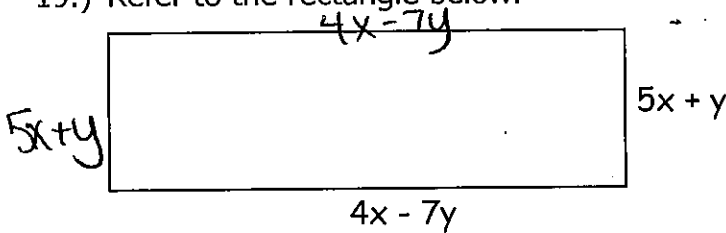
$x^2 - 6x - 16$

18.) $(3x+4)(5x+7)$

$15x^2 + 21x + 20x + 28$

$15x^2 + 41x + 28$

19.) Refer to the rectangle below.



a.) Find the perimeter of the figure in terms of x and y.

$(4x - 7y) + (4x - 7y) + (5x + y) + (5x + y)$
 $18x - 12y$

b.) Find the area of the figure in terms of x and y.

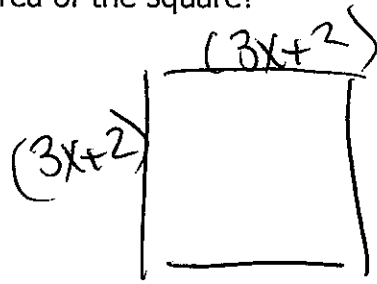
$(4x - 7y)(5x + y)$
 $20x^2 + 4xy - 35xy - 7y^2$
 $20x^2 - 31xy - 7y^2$

20.) If a square has a side of $(3x + 2)$, what is the area of the square?

$$(3x+2)(3x+2)$$

$$9x^2 + 6x + 6x + 4$$

$$\boxed{9x^2 + 12x + 4}$$



21.) If a square has a side of $(5x - 4)$, what is the area of the square?

$$(5x-4)(5x-4)$$

$$\begin{array}{|c|} \hline 5x-4 \\ \hline \end{array} \begin{array}{|c|} \hline 5x-4 \\ \hline \end{array} 25x^2 - 20x - 20x + 16$$

$$\boxed{25x^2 - 40x + 16}$$

Multiply the following expressions.

22.) $(2x+5)^2$

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

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

$$\boxed{4x^2 + 20x + 25}$$

23.) $(3x-7)(3x+7)$

$$9x^2 + 21x - 21x - 49$$

$$\boxed{9x^2 - 49}$$

24.) $(4x-5)(2x^2-3x+6)$

	$2x^2$	$-3x$	6
$4x$	$8x^3$	$-12x^2$	$24x$
-5	$-10x^2$	$+15x$	-30

$$8x^3 - 22x^2 + 39x - 30$$

25.) $(4x^2 - 9x + 5)^2$

$$(4x^2 - 9x + 5)(4x^2 - 9x + 5)$$

	$4x^2$	$-9x$	5
$4x^2$	$16x^4$	$-36x^3$	$20x^2$
$-9x$	$-36x^3$	$81x^2$	$-45x$
5	$20x^2$	$-45x$	25

$$\boxed{16x^4 - 72x^3 + 121x^2 - 90x + 25}$$

Factor the following problems.

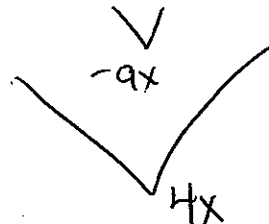
26.) $6x^2 + 12x$

GCF:

$$6x(x+2)$$

27.) $x^2 - 5x - 36$

$$(x-9)(x+4)$$



$$\underline{-9 \cdot 4 = -36}$$

$$28.) x^2 - 3x - 18$$

$$(x-6)(x+3)$$

$$\begin{array}{c} -6x \\ \vee \\ 3x \end{array}$$

$$\underline{-6 \cdot 3 = -18}$$

$$30.) x^2 + x - 12$$

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

$$\begin{array}{c} 4x \\ \vee \\ -3x \end{array}$$

$$\underline{4 \cdot -3 = -12}$$

$$32.) x^2 - 10x + 21$$

$$(x-7)(x-3)$$

$$\begin{array}{c} -7x \\ \vee \\ -3x \end{array}$$

$$\underline{-7 \cdot -3 = 21}$$

$$34.) x^2 + 3x - 28$$

$$(x+7)(x-4)$$

$$\begin{array}{c} 7x \\ \vee \\ -4x \end{array}$$

$$7 \cdot -4 = -28$$

$$36.) 32a^2b^3c^4 + 64a^4b^3c^2$$

GCF

$$32a^2b^3c^2(c^2 + 2a^2)$$

$$38.) x^2 - x - 6$$

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

$$\begin{array}{c} -3x \\ \vee \\ 2x \end{array}$$

$$\underline{-3 \cdot 2 = -6}$$

$$40.) x^2 + x - 20$$

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

$$\begin{array}{c} 5x \\ \vee \\ -4x \end{array}$$

$$5 \cdot -4 = -20$$

$$29.) x^2 + 7x + 6$$

$$(x+6)(x+1)$$

$$\begin{array}{c} 6x \\ \vee \\ 1x \end{array}$$

$$\underline{6 \cdot 1 = 6}$$

$$31.) x^2 - 5x - 14$$

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

$$\begin{array}{c} -7x \\ \vee \\ 2x \end{array}$$

$$\underline{-7 \cdot 2 = -14}$$

$$33.) x^2 - x - 90$$

$$(x-10)(x+9)$$

$$\begin{array}{c} -10x \\ \vee \\ 9x \end{array}$$

$$\underline{-10 \cdot 9 = -90}$$

$$35.) 8x^2y - 12xy^2$$

GCF

$$4xy(2x-3y)$$

$$37.) x^2 - 18x + 17$$

$$(x-17)(x-1)$$

$$\begin{array}{c} -17x \\ \vee \\ -1x \end{array}$$

$$\underline{-17 \cdot -1 = 17}$$

$$39.) 3x^2y^3 + 2x^4y^3$$

GCF

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

$$41.) x^2 - 4x - 32$$

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

$$\begin{array}{c} -8x \\ \vee \\ 4x \end{array}$$

$$\underline{-8 \cdot 4 = -32}$$