Name:_____Date:_____Per:_____

Chapter 9 Practice Test
Polynomials and Factoring

Read each problem carefully and be sure to show ALL of your work. Make sure all numbers are written clearly and to circle each answer. Do your best!

Find the sum, difference or product.

1. $(3x^3 - 5x + 1) - (2x^3 + 4x - 9)$

1. Change subtraction to adding a negative, which
Then changes the sign of every item in the second parenthesis.

$(3x^3 - 5x + 1) + (-2x^3 + -4x + 9)$

2. Add like terms

$1x^3 - 9x + 10$

2. $(5x - 9)^2$

Since $5x - 9$ is being squared, this
Means to multiply it by itself.

$(5x - 9)(5x - 9)$ Now FOIL

$25x^2 - 45x - 45x + 81$
$25x^2 - 90x + 81$

3. $(2x^2 + 3x - 3)(4x + 7)$

1. Distribute each item in the trinomial to each item in the binomial.

$8x^3 + 14x^2 + 12x^2 + 21x - 12x - 21$

2. Combine like terms.

$8x^3 + 26x^2 + 9x - 21$

For numbers 4 and 5, use the GCF to complete the problem.

4. Factor: $27x^3z^5 - 9x^4z^2 + 3xz$

Undistribute **_all_** pieces in common, including variables

$3xz(9x^2z^4 - 3x^3z + 1)$

Check by distributing, should get back original.

5. Solve: $4x^2 = 8x$

1. Make it equal 0 first.

$4x^2 - 8x = 0$

2. Factoring using the GCF

$4x(x - 2) = 0$

3. Solve for x
$x = 0$ and $x = 2$

Factor completely.

6. $x^2 - 13x - 48$

UNFOIL

    $(x + 3)(x - 16)$

Check by FOILing

7. $2x^2 + 16x + 14$

Take out the GCF First

$2(x^2 + 8x + 14)$

Factor the new trinomial

$2(x + 1)(x + 7)$

*There was a typo on this problem.
Should be −56

8. $-x^2 + 18x - 56$

Factor out a −1 first

$-1(x^2 - 18x + 56)$

$-1(x - 14)(x - 4)$

9. $3x^2 + 11x - 20$

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

10. $4x^2 - 28x + 49$

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

11. $2x^2 - 3x - 27$

    $(2x - 9)(x + 3)$

Solve each polynomial equation.

12. $x^2 + 8x = -15$

13. $7x^2 - 15x = -2$

Needs to equal 0 before you can begin.

    $x^2 + 8x + 15 = 0$

    $7x^2 - 15x + 2 = 0$

Now Factor

    $(x + 5)(x + 3) = 0$

    $(7x - 1)(x - 2) = 0$

Solve for x

    $x = -5$ and $x = -3$

    $x = \frac{1}{7}$ and $x = 2$

14. Factor: $144x^2 - 25$

15. Solve: $4x^2 - 9 = 0$

$(12x + 5)(12x - 5)$

$(2x + 3)(2x - 3) = 0$

Solve for x

$x = -\dfrac{3}{2}$ and $x = \dfrac{3}{2}$

16. A rectangular picture is 4 cm longer than it is wide. It is surrounded by a mat that is 2 cm wide. The combined area of the picture and the mat is 140 cm². Find the dimensions of the picture.

To find the area of a rectangle, first find the length and the width.

The length extends from end to end, which is:

$2 + w + 4 + 2$

Length: $w + 8$

The width extends from top to bottom which is:

$2 + w + 2$

Width: $w + 4$

To find area, use the formula $A = lw$

$(w + 8)(w + 4) = 140$ *set equal to 140 since that is the area

$w^2 + 12w + 32 = 140$ *Simplify by FOILing

$w^2 + 12w - 108 = 0$ *Make it equal 0 by subtracting 140

$(w + 18)(w - 6) = 0$ *Factor

$w = 6$