HW# _____ Factoring Review WS

Date _____ Period _____

On a separate piece of paper factor completely #21-41.

Factoring $x^2 + bx + c$ (pp. 385–390)

Factor $x^2 + 6x - 27$.

Notice that b = 6 and c = -27. Because c is negative, the factors p and q must have different signs so that pq is negative.

Find two integer factors of -27 whose sum is 6.

Factors of −27	-27, 1	-1, 27	-9, 3	-3, 9
Sum of factors	-26	26	-6	6

The values of p and q are -3 and 9.

So,
$$x^2 + 6x - 27 = (x - 3)(x + 9)$$
.

Factor the polynomial.

21.
$$p^2 + 2p - 35$$

22.
$$b^2 + 18b + 80$$

23.
$$z^2 - 4z - 2$$

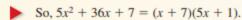
21.
$$p^2 + 2p - 35$$
 22. $b^2 + 18b + 80$ **23.** $z^2 - 4z - 21$ **24.** $x^2 - 11x + 28$

Factoring $ax^2 + bx + c$ (pp. 391–396)

Factor $5x^2 + 36x + 7$.

There is no GCF, so you need to consider the possible factors of a and c. Because b and c are both positive, the factors of c must be positive. Use a table to organize information about the factors of a and c.

	Middle term	Possible factorization	Factors of 7	Factors of 5	
X	7x + 5x = 12x	(x+1)(5x+7)	1, 7	1, 5	
1	x + 35x = 36x	(x+7)(5x+1)	7, 1	1, 5	



Factor the polynomial.

25.
$$3t^2 + 16t - 12$$

26.
$$-5y^2 - 22y - 8$$

27.
$$6x^2 + 17x + 7$$

28.
$$-2y^2 + 7y - 6$$

29.
$$3z^2 + 26z - 9$$

30.
$$10a^2 - 13a - 3$$

Factor each polynomial.

a.
$$x^2 - 16$$

$$x^{2} - 16 = x^{2} - 4^{2}$$
$$= (x + 4)(x - 4)$$

Write as
$$a^2 - b^2$$
.

Difference of two squares pattern

b.
$$25x^2 - 30x + 9$$

$$25x^{2} - 30x + 9 = (5x)^{2} - 2(5x)(3) + 3^{2}$$
$$= (5x - 3)^{2}$$

Write as
$$a^2 - 2ab + b^2$$
.

Perfect square trinomial pattern

Factor the polynomial.

31.
$$x^2 - 9$$

32.
$$y^2 - 100$$

33.
$$z^2 - 6z + 9$$

34.
$$m^2 + 16m + 64$$

7.8 Factoring Polynomials Completely (pp. 403-408)

Factor each polynomial completely.

a.
$$x^3 + 4x^2 - 3x - 12$$

$$x^{3} + 4x^{2} - 3x - 12 = (x^{3} + 4x^{2}) + (-3x - 12)$$
$$= x^{2}(x + 4) + (-3)(x + 4)$$

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

Factor out
$$(x + 4)$$
.

b.
$$2x^4 - 8x^2$$

$$2x^4 - 8x^2 = 2x^2(x^2 - 4)$$
$$= 2x^2(x^2 - 2^2)$$
$$= 2x^2(x + 2)(x - 2)$$

Factor out
$$2x^2$$
.

Write as
$$a^2 - b^2$$
.

Difference of two squares pattern

c.
$$2x^3 + 18x^2 - 72x$$

$$2x^3 + 18x^2 - 72x = 2x(x^2 + 9x - 36)$$
$$= 2x(x + 12)(x - 3)$$

Factor
$$x^2 + 9x - 36$$
.

Factor the polynomial completely.

35.
$$n^3 - 9n$$

36.
$$x^2 - 3x + 4ax - 12a$$
 37. $2x^4 + 2x^3 - 20x^2$

37
$$2x^4 + 2x^3 - 20x^2$$

Solve the equation.

38.
$$3x^3 - 9x^2 - 54x = 0$$
 39. $16x^2 - 36 = 0$

39.
$$16x^2 - 36 = 0$$

40.
$$z^3 + 3z^2 - 25z - 75 = 0$$

41. A box in the shape of a rectangular prism has a volume of 96 cubic feet. The box has a length of (x + 8) feet, a width of x feet, and a height of (x - 2) feet. Find the dimensions of the box.