Unit 6 Problem Set Packet – Factoring

Name: _____ Class: _____

PS 6.1 – Factoring by GCF

1.) $5x-30$

2.) $2x^2-30$

3.) $4x-12$

4.) $-5x^2-20x$

5.) $3x^2+9$

6.) $7x^2+24x$

7.) x^3+5x^2

8.) $3x^3+27x^2+9x$

9.) $8x^4+4x^2-12x$

10.) $ab^3+2a^2b^2$

11.) $22x^3y^2z^2+33x^2y^3z^2+66x^2y^2z^3$

12.) $189x^3-108x^2+162x$

13.) Andrea reduced $-7x^2+14x$ to $-7x(x+2)$. Is she correct? Explain your answer.

14.) The product of two consecutive integers is x^2+x. What are the two integers (in terms of x?

15.) The area of a rectangular room is $-15x^6+3x^4-18x^3+21x$ and the width of the room is $3x$. What is the length of the room in terms of x?

16.) Isolate x. $4x+3ax=7$

17.) Isolate y. $5y+8by=6b$

PS 6.2 – Factoring Trinomials by Trial-and-Error

Note: The factoring problems are mixed and some problems are prime.

18.) x^2+8x+7

19.) $3x^2-2x-8$

20.) $x^2-8x+15$

21.) $x^2+8x+15$

22.) $-100+99v+v^2$

23.) $3x^2+10x-8$

24.) $3x^2+x-14$

25.) $2x^2-21x-36$

26.) $-2x^2+3x+9$

27.) $r^2+\frac{6}{4}r+\frac{9}{16}$

28.) x^2+5x+6

29.) $2x^2+3x-2$

30.) $x^2+8x-12$

31.) $x^2+15x+56$

32.) $2x^6-3x$

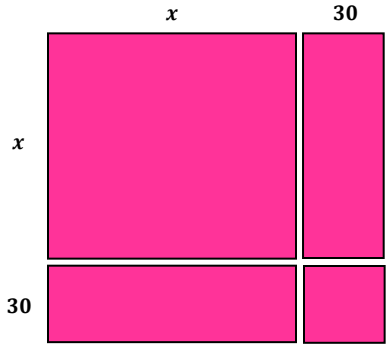
33.) x^2-x-2

34.) $3x^2+109x+36$

35.) $4x^2+24x+35$

36.) Find the perimeter of a rectangular piece of land whose area is $x^2 + 8x - 9$.

37.) The parking lot at Gene Simon's Donut Palace is going to be enlarged, so that there will be an additional 30 ft. of parking space in the front and 30 ft. on the side of the lot. Write an expression in terms of x that can be used to represent the area of the new parking lot.



Explain how your solution is demonstrated in the area model.

PS 6.3 – Factoring Trinomials by Grouping

Note: The factoring problems are mixed and some problems are prime.

38.) $m^2 + m - 90$

39.) $k^2 - 13k + 40$

40.) $3x^2 - 2x - 5$

41.) $-2x^2 + 5x - 2$

42.) $-4x^2 + 4x - 1$

43.) $6x^2 + 7x + 2$

44.) $3x^2 + 10x + 7$

45.) $a^2 + 2ab - 3b^2$

46.) $x^2 + 11x - 26$

47.) $x^4 + 3x^2 - 10$

48.) $x^2 - 3x + 10$

49.) $4x^6 - 8x$

50.) $3x^2 + xy - 12x - 4y$

51.) $a^3 - 2a^2 + 5a - 10$

52.) $3xy - 14 + 21x - 2y$

53.) $3x^2 - 22x + 24$

54.) The area of a rectangle is represented by the expression $18x^2 + 12x + 2$ square units. Write two expressions to represent the dimensions.

55.) The area of a rectangular soccer field can be expressed as $x^2 - 6x - 27$ and the length is $(x - 9)$, what is the width?

For 56 – 58, find all values of k so each trinomial can be factored using integers.

56.) $r^2 + kr - 13$

57.) $x^2 + kx + 10$

58.) $x^2 + 8x + k, k > 0$

PS 6.4 – Factoring Special Cases of Binomials/Trinomials

Note: The factoring problems are mixed and some problems are prime.

59.) $t^2 - 25$

60.) $4x^2 - 9$

61.) $16h^2 - 36k^2$

62.) $x^2 - 20x + 100$

63.) $x^4 - 4$

64.) $x^6 - 25$

65.) $9y^2 - 100z^2$

66.) $x^2 + 10x + 25$

67.) $x^2 - 16x - 64$

68.) $y^8 - 81x^4$

69.) $4x^2 - 12x + 9$

70.) $x^2 - 8x + 16$

71.) $-9r^2 + 81$

72.) $x^{2m} - 36y^2$

73.) $16b^2c^4 + 25d^8$

74.) $\frac{1}{16}x^2 - 25z^2$

75.) $a^4 - b^6$

76.) $9x^2 + 12x + 4$

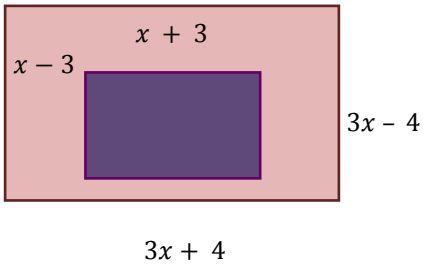
77.) $r^4 - 16s^4$

78.) $4 - b^2$

79.) The area of a square is $x^2 - 14x + 49$. State the length of one side of the square.

80.) The measure of a side of a square is x units. A new square is formed with each side 6 units longer than the original square's side. Write an expression to represent the area of the new square. (Hint: Draw the new square and count the squares and rectangles.)

81.) In the accompanying diagram, the width of the inner rectangle is represented by $x - 3$ and its length by $x + 3$. The width of the outer rectangle is represented by $3x + 4$ and its length by $3x - 4$.



a.) Find the area of the larger rectangle.

b.) Find the area of the smaller rectangle.

c.) Express the area of the lighter, outer shaded region as a polynomial in terms of x.

PS 6.5 – Factoring Completely

82.) $2a^2+6a+18$

83.) $5x^2-5$

84.) $4n-n^3$

85.) $-2x^3-2x^2+112x$

86.) $8x^2+20x+8$

87.) $x^2+\frac{11}{2}x+\frac{5}{2}$

88.) $6x^3-2x^2-4x$

89.) $2x^2-x-6$

90.) $10x^2-10$

91.) $3x^2-24x+48$

92.) $9x^2+15x+4$

93.) $18a^2-48a+32$

94.) $ax^2-18ax+77a$

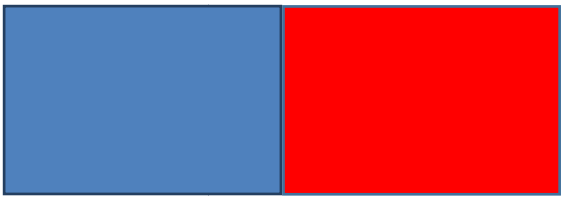
95.) d^8-d^2

96.) $3m^3n+48m^2n^2+192mn^3$

97.) $81x^4z^4-16y^{12}z^4$

98.) The area of a particular triangle can be represented by $x^2+\frac{3}{2}x-\frac{9}{2}$. What are its base and height in terms of x?

99.) Two mathematicians are neighbors, with each owning a separate rectangular plot of land, which share a boundary and have the same dimensions. They agree that each has an area of $2x^2+3x+1$ square units. One mathematician sells his plot to the other. The other wants to put a fence around the perimeter of his new combined plot of land. How many linear units of fencing will he need in terms of x?



Bonus: This question has two correct approaches and two different correct solutions. Can you find the other one?

100.)Draw a smiley face because you are done with your practice packet!