Math 095--Review for Test 7--page 1

Factor completely.

1. $36x + 45$
2. $5x^7 - 4x^3$
3. $10m^4 + 13m^3 + 2m^2$
4. $m(m + 3) + 2(m + 3)$
5. $ax + ay + bx + by$
6. $4y^2 - 8y + 3y - 6$
7. $k^2 + 7k + 10$
8. $z^2 - 13z + 40$
9. $a^2 + 17a - 60$
10. $v^2 - 5v - 50$
11. $x^2 + 5xy + 6y^2$
12. $a^2 - 3ab - 4b^2$
13. $4k^2 - 36k + 80$
14. $3x^5 + 6x^4 - 45x^3$
15. $x^2y + 7xy^2 - 18y^3$
16. $6m^2 + 13m + 5$
17. $10w^2 - 19w + 6$
18. $9e^2 + 16e - 4$
19. $8x^2 - 6x - 5$
20. $12g^2 + 19gh + 4h^2$
21. $10x^4 - 26x^3 - 12x^2$
22. $x^2 + 36$
23. $x^2 - 36$
24. $m^2 - 81$
25. $16y^2 - 25$
26. $49a^2 - 36b^2$
27. $2x^2 - 18$
28. $x^3 + 8$
29. $y^3 - 27$
30. $64z^3 + 125$

Solve by factoring.

31. $x^2 + 8x + 15 = 0$
32. $y^2 - 12y + 20 = 0$
33. $k^2 + 3k = 40$
34. $m^2 = 2m + 24$
35. $4x^2 + 16x + 7 = 0$
36. $8k^2 + 3 = 10k$
37. $2a^2 + 9a = 18$
38. $100z^2 - 81 = 0$
39. a. $x(x + 2) = 0$
    b. $x(x + 2) = 35$

Set up and solve.

40. The length of a rectangle is 3 inches more than the width. The area is 40 square inches. Find the length and width.

41. The product of two positive numbers is 40. Find the numbers if one number is 6 more than the other.

42. In a rectangle, the length is 8 inches and the width is 6 inches. Find the length of the diagonal.

Factor completely.

43. $x^3 + 7x^2 - x - 7$
44. $x^3 + 5x^2 - 16x - 80$
45. $x^3 + 2x^2 - 50x - 100$
46. $x^4 - 5x^2 + 4$
47. $x^4 - 13x^2 + 36$
48. $x^4 - 37x^2 + 36$

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Answer Key.

1. $9(4x + 5)$

2. $x^3(5x^4 - 4)$

3. $m^2(10m^2 + 13m + 2)$

4. $(m + 3)(m + 2)$

5. $a(x + y) + b(x + y)$
$(x + y)(a + b)$

6. $4y(y - 2) + 3(y - 2)$
$(y - 2)(4y + 3)$

7. $(k + 2)(k + 5)$

8. $(z - 5)(z - 8)$

9. $(a - 3)(a + 20)$

10. $(v + 5)(v - 10)$

11. $(x + 2y)(x + 3y)$

12. $(a + b)(a - 4b)$

13. $4(k^2 - 9k + 20)$
$4(k - 4)(k - 5)$

14. $3x^3(x^2 + 2x - 15)$
$3x^3(x - 3)(x + 5)$

15. $y(x^2 + 7xy - 18y^2)$
$y(x - 2y)(x + 9y)$

16. $(3m + 5)(2m + 1)$

17. $(5w - 2)(2w - 3)$

18. $(9e - 2)(e + 2)$

19. $(4x - 5)(2x + 1)$

20. $(4g + h)(3g + 4h)$

21. $2x^2(5x^2 - 13x - 6)$
$2x^2(5x + 2)(x - 3)$

22. prime

23. $(x + 6)(x - 6)$

24. $(m + 9)(m - 9)$

25. $(4y + 5)(4y - 5)$

26. $(7a + 6b)(7a - 6b)$

27. $2(x^2 - 9)$
$2(x + 3)(x - 3)$

28. $(x + 2)(x^2 - 2x + 4)$

29. $(y - 3)(y^2 + 3y + 9)$

30. $(4z + 5)(16z^2 - 20z + 25)$

31. $(x + 3)(x + 5) = 0$
$\{-3, -5\}$

32. $(y - 2)(y - 10) = 0$
$\{2, 10\}$

33. $k^2 + 3k - 40 = 0$
$(k - 5)(k + 8) = 0$
$\{5, -8\}$

34. $m^2 - 2m - 24 = 0$
$(m + 4)(m - 6) = 0$
$\{-4, 6\}$

35. $(2x + 1)(2x + 7) = 0$
$\left\{-\frac{1}{2}, -\frac{7}{2}\right\}$

36. $8k^2 - 10k + 3 = 0$
$(4k - 3)(2k - 1) = 0$
$\left\{\frac{3}{4}, \frac{1}{2}\right\}$

37. $2a^2 + 9a - 18 = 0$
$(2a - 3)(a + 6) = 0$
$\left\{\frac{3}{2}, -6\right\}$

38. $(10z + 9)(10z - 9) = 0$
$\left\{-\frac{9}{10}, \frac{9}{10}\right\}$

39. a. $\{0, -2\}$

b. $x^2 + 2x - 35 = 0$
$\{5, -7\}$

40. width = x
length = x + 3
$(x + 3)(x) = 40$
$x^2 + 3x - 40 = 0$
solve
x = 5 (x = −8 won't work)
Width is 5 inches, and
length is 8 inches.

41. other number = x
one number = x + 6
$(x)(x + 6) = 40$
$x^2 + 6x - 40 = 0$
solve
x = 4 (x = −10 is negative)
The two positive even numbers
are 4 and 10.

42. diagonal/hypotenuse = x
$(8)^2 + (6)^2 = x^2$
$0 = x^2 - 100$
solve
x = 10 (x = −10 won't work)
The diagonal is 10 inches.

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43. $x^3 + 7x^2 - x - 7$
$x^2(x + 7) - 1(x + 7)$
$(x + 7)(x^2 - 1)$
$(x + 7)(x + 1)(x - 1)$

44. $x^3 + 5x^2 - 16x - 80$
$x^2(x + 5) - 16(x + 5)$
$(x + 5)(x^2 - 16)$
$(x + 5)(x + 4)(x - 4)$

45. $x^3 + 2x^2 - 25x - 50$
$x^2(x + 2) - 25(x + 2)$
$(x + 2)(x^2 - 25)$
$(x + 2)(x + 5)(x - 5)$

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

47. $x^4 - 13x^2 + 36$
$x^4 - 4x^2 - 9x^2 + 36$
$x^2(x^2 - 4) - 9(x^2 - 4)$
$(x^2 - 4)(x^2 - 9)$
$(x + 2)(x - 2)(x + 3)(x - 3)$

48. $x^4 - 37x^2 + 36$
$x^4 - x^2 - 36x^2 + 36$
$x^2(x^2 - 1) - 36(x^2 - 1)$
$(x^2 - 1)(x^2 - 36)$
$(x + 1)(x - 1)(x + 6)(x - 6)$