

EXAM 6 REVIEW

Math 200 – Fall 2006

The sixth exam will be on Friday, November 17.

The exam will cover Chapter 7

All homework from Chapter 7 is due at the exam (late assignments are NOT accepted).

You may use your calculator on this exam.

You may NOT use your notes, homework, book, or neighbors on this exam. You do NOT get a $3\frac{1}{2} \times 5$ “cheat-sheet” for this exam.

Below is a review for this exam. Anything on the review could possibly be on the exam. The exam will be shorter than the review.

CHAPTER 7 REVIEW EXERCISES

In Exercises 1–5, factor each polynomial using the greatest common factor. If there is no common factor other than 1 and the polynomial cannot be factored, so state.

- $30x - 45$
- $12x^3 + 16x^2 - 400x$
- $30x^4y + 15x^3y + 5x^2y$
- $7(x + 3) - 2(x + 3)$
- $7x^2(x + y) - (x + y)$

In Exercises 6–9, factor by grouping.

- $x^3 + 3x^2 + 2x + 6$
- $xy + y + 4x + 4$
- $x^3 + 5x + x^2 + 5$
- $xy + 4x - 2y - 8$

In Exercises 10–17, factor completely, or state that the trinomial is prime.

- $x^2 - 3x + 2$
- $x^2 - x - 20$
- $x^2 + 19x + 48$
- $x^2 - 6xy + 8y^2$
- $x^2 + 5x - 9$
- $x^2 + 16xy - 17y^2$
- $3x^2 + 6x - 24$
- $3x^3 - 36x^2 + 33x$

In Exercises 18–26, factor completely, or state that the trinomial is prime.

- $3x^2 + 17x + 10$
- $5y^2 - 17y + 6$
- $4x^2 + 4x - 15$
- $5y^2 + 11y + 4$
- $8x^2 + 8x - 6$
- $2x^3 + 7x^2 - 72x$
- $12y^3 + 28y^2 + 8y$
- $2x^2 - 7xy + 3y^2$
- $5x^2 - 6xy - 8y^2$

In Exercises 27–30, factor each difference of two squares completely.

- $4x^2 - 1$
- $81 - 100y^2$
- $25a^2 - 49b^2$
- $z^4 - 16$

In Exercises 31–34, factor completely, or state that the polynomial is prime.

- $2x^2 - 18$
- $x^2 + 1$
- $9x^3 - x$
- $18xy^2 - 8x$

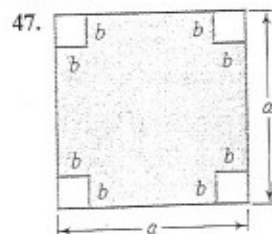
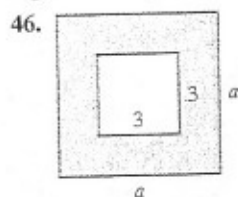
In Exercises 35–41, factor any perfect square trinomials, or state that the polynomial is prime.

- $x^2 + 22x + 121$
- $x^2 - 16x + 64$
- $9y^2 + 48y + 64$
- $16x^2 - 40x + 25$
- $25x^2 + 15x + 9$
- $36x^2 + 60xy + 25y^2$
- $25x^2 - 40xy + 16y^2$

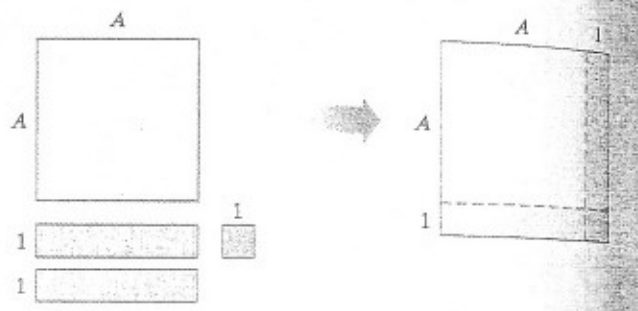
In Exercises 42–45, factor using the formula for the sum or difference of two cubes.

- $x^3 - 27$
- $64x^3 + 1$
- $54x^3 - 16y^3$
- $27x^3y + 8y$

In Exercises 46–47, find the formula for the area of the shaded region and express it in factored form.



48. The figure shows a geometric interpretation of a factorization. Use the sum of the areas of the four pieces on the left and the area of the square on the right to write the factorization that is illustrated.



In Exercises 49–81, factor completely, or state that the polynomial is prime.

49. $x^3 - 8x^2 + 7x$
50. $10y^2 + 9y + 2$
51. $128 - 2y^2$
52. $9x^2 + 6x + 1$
53. $20x^7 - 36x^3$
54. $x^3 - 3x^2 - 9x + 27$
55. $y^2 + 16$
56. $2x^3 + 19x^2 + 35x$
57. $3x^3 - 30x^2 + 75x$
58. $3x^5 - 24x^2$
59. $4y^4 - 36y^2$
60. $5x^2 + 20x - 105$
61. $9x^2 + 8x - 3$
62. $10x^5 - 44x^4 + 16x^3$
63. $100y^2 - 49$
64. $9x^5 - 18x^4$
65. $x^4 - 1$
66. $2y^3 - 16$
67. $x^3 + 64$
68. $6x^2 + 11x - 10$
69. $3x^4 - 12x^2$
70. $x^2 - x - 90$
71. $25x^2 + 25xy + 6y^2$
72. $x^4 + 125x$
73. $32y^3 + 32y^2 + 6y$
74. $2y^2 - 16y + 32$
75. $x^2 - 2xy - 35y^2$
76. $x^2 + 7x + xy + 7y$
77. $9x^2 + 24xy + 16y^2$
78. $2x^4y - 2x^2y$
79. $100y^2 - 49z^2$
80. $x^2 + xy + y^2$
81. $3x^4y^2 - 12x^2y^4$

Review Exercises

1. $15(2x - 3)$
2. $4x(3x^2 + 4x - 100)$
3. $5x^2y(6x^2 + 3x + 1)$
4. $5(x + 3)$
5. $(7x^2 - 1)(x + y)$
6. $(x^2 + 2)(x + 3)$
7. $(x + 1)(y + 4)$
8. $(x^2 + 5)(x + 1)$
9. $(x - 2)(y + 4)$
10. $(x - 2)(x - 1)$
11. $(x - 5)(x + 4)$
12. $(x + 3)(x + 16)$
13. $(x - 4y)(x - 2y)$
14. prime
15. $(x + 17y)(x - y)$
16. $3(x + 4)(x - 2)$
17. $3x(x - 11)(x - 1)$
18. $(x + 5)(3x - 1)$
19. $(y - 3)(5y - 2)$
20. $(2x + 5)(2x - 3)$
21. prime
22. $2(2x + 3)(2x - 1)$
23. $x(2x - 9)(x + 8)$
24. $4y(3y + 1)(y - 1)$
25. $(2x - y)(x - 3y)$
26. $(5x + 4y)(x - 2y)$
27. $(2x + 1)(2x - 1)$
28. $(9 + 10y)(9 - 10y)$
29. $(5a + 7b)(5a - 7b)$
30. $(z^2 + 4)(z + 2)(z - 2)$
31. $2(x + 3)(x - 3)$
32. prime
33. $x(3x + 1)(3x - 1)$
34. $2x(3y + 2)(3y - 2)$
35. $(x + 1)(x - 1)$
36. $(x - 8)^2$
37. $(3y + 8)^2$
38. $(4x - 5)^2$
39. prime
40. $(6x + 5y)^2$
41. $(5x - 4y)^2$
42. $(x - 3)(x^2 + 3x + 9)$
43. $(4x + 1)(16x^2 - 4x + 1)$
44. $2(3x - 2y)(9x^2 + 6xy + 4y^2)$
45. $y(3x + 2)(9x^2 - 6x + 4)$
46. $(a + 3)(a - 3)$
47. $(a + 2b)(a - 2b)$
48. $A^2 + 2A + 1 = (A + 1)^2$
49. $x(x - 7)(x - 1)$
50. $(5y + 2)(2y + 1)$
51. $2(8 + y)(8 - y)$
52. $(3x + 1)^2$
53. $4x^3(5x^4 - 9)$
54. $(x - 3)^2(x + 3)$
55. prime
56. $x(2x + 5)(x + 7)$
57. $3x(x - 5)^2$
58. $3x^2(x - 2)(x^2 + 2x + 4)$
59. $4y^2(y + 3)(y - 3)$
60. $5(x + 7)(x - 3)$
61. prime
62. $2x^3(5x - 2)(x - 4)$
63. $(10y + 7)(10y - 7)$
64. $9x^4(x - 2)$
65. $(x^2 + 1)(x + 1)(x - 1)$
66. $2(y - 2)(y^2 + 2y + 4)$
67. $(x + 4)(x^2 - 4x + 16)$
68. $(3x - 2)(2x + 5)$
69. $3x^2(x + 2)(x - 2)$
70. $(x - 10)(x + 9)$
71. $(5x + 2y)(5x + 3y)$
72. $x(x + 5)(x^2 - 5x + 25)$
73. $2y(4y + 3)(4y + 1)$
74. $2(y - 4)^2$
75. $(x + 5y)(x - 7y)$
76. $(x + y)(x + 7)$
77. $(3x + 4y)^2$
78. $2x^2y(x + 1)(x - 1)$
79. $(10y + 7z)(10y - 7z)$
80. prime
81. $3x^2y^2(x + 2y)(x - 2y)$
82. 0 and 12
83. 7 and $-\frac{9}{4}$
84. -7 and 2
85. -4 and 0
86. -8 and $\frac{1}{2}$
87. -4 and 8
88. -8 and 7
89. 7
90. $-\frac{10}{3}$ and $\frac{10}{3}$
91. -5 and -2
92. $\frac{1}{3}$ and 7
93. 2 sec
94. width: 5 ft; length: 8 ft
95. 11 m by 11 m

In Exercises 82–83, solve each equation using the zero-product principle.

82. $x(x - 12) = 0$

83. $3(x - 7)(4x + 9) = 0$

In Exercises 84–92, use factoring to solve each quadratic equation.

84. $x^2 + 5x - 14 = 0$

5. $5x^2 + 20x = 0$

86. $2x^2 + 15x = 8$

87. $x(x - 4) = 32$

88. $(x + 3)(x - 2) = 50$

89. $x^2 = 14x - 49$

90. $9x^2 = 100$

91. $3x^2 + 21x + 30 = 0$

92. $3x^2 = 22x - 7$

93. You dive from a board that is 32 feet above the water. The formula

$$h = -16t^2 + 16t + 32$$

describes your height above the water, h , in feet, t seconds after you dive. How long will it take you to hit the water?

94. The length of a rectangular sign is 3 feet longer than the width. If the sign has space for 40 square feet of advertising, find its length and its width.
95. The square lot shown here is being turned into a garden with a 3-meter path at one end. If the area of the garden is 88 square meters, find the dimensions of the square lot.

