EXAM 5 REVIEW

Math 200 – Spring 2007

The fifth exam will be on Wednesday, April 4.

The exam will cover Chapter 6.

All homework from Chapter 6 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 $3^1/_2$ X 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 6 REVIEW EXERCISES

In Exercises 1–3, identify each polynomial as a monomial, binomial, or trinomial. Give the degree of the polynomial.

1. $7x^4 + 9x$
2. $3x + 5x^2 - 2$
3. $16x$

In Exercises 4–8, add or subtract as indicated.

4. $(-6x^3 + 7x^2 - 9x + 3) + (14x^3 + 3x^2 - 11x - 7)$
5. $(9y^3 - 7y^2 + 5) + (4y^3 - y^2 + 7y - 10)$
6. $(5y^2 - y - 8) - (-6y^2 + 3y - 4)$
7. $(13x^4 - 8x^3 + 2x^2) - (5x^4 - 3x^3 + 2x^2 - 6)$
8. Subtract $x^4 + 7x^2 - 11x$ from $-13x^4 - 6x^2 + 5x$.

In Exercises 9–11, add or subtract as indicated.

9. Add.
$$\begin{array}{r} 7y^4 - 6y^3 + 4y^2 - 4y \\ \underline{\quad y^3 - y^2 + 3y - 4} \end{array}$$
10. Subtract.
$$\begin{array}{r} 7x^2 - 9x + 2 \\ \underline{-(4x^2 - 2x - 7)} \end{array}$$
11. Subtract.
$$\begin{array}{r} 5x^3 - 6x^2 - 9x + 14 \\ \underline{-(-5x^3 + 3x^2 - 11x + 3)} \end{array}$$
12. The polynomial $104.5x^2 - 1501.5x + 6016$ models the death rate per year per 100,000 men for men averaging x hours of sleep each night. Evaluate the polynomial when $x = 10$. Describe what the answer means in practical terms.

In Exercises 13–17, simplify each expression.

13. $x^{20} \cdot x^3$
14. $y \cdot y^5 \cdot y^8$
15. $(x^{20})^5$
16. $(10y)^2$
17. $(-4x^{10})^3$

In Exercises 18–26, find each product.

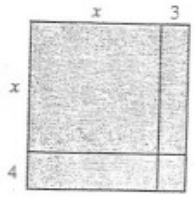
18. $(5x)(10x^3)$
19. $(-12y^7)(3y^4)$
20. $(-2x^5)(-3x^4)(5x^3)$
21. $7x(3x^2 + 9)$
22. $5x^3(4x^2 - 11x)$
23. $3y^2(-7y^2 + 3y - 6)$
24. $2y^5(8y^3 - 10y^2 + 1)$
25. $(x + 3)(x^2 - 5x + 2)$
26. $(3y - 2)(4y^2 + 3y - 5)$

In Exercises 27–28, use a vertical format to find each product.

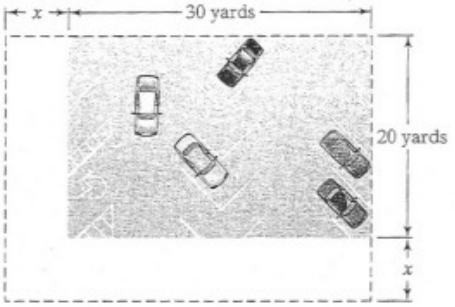
27.
$$\begin{array}{r} y^2 - 4y + 7 \\ \underline{\quad 3y - 5} \end{array}$$
28.
$$\begin{array}{r} 4x^3 - 2x^2 - 6x - 1 \\ \underline{\quad 2x + 3} \end{array}$$

In Exercises 29–41, find each product.

29. $(x + 6)(x + 2)$
30. $(3y - 5)(2y + 1)$
31. $(4x^2 - 2)(x^2 - 3)$
32. $(5x + 4)(5x - 4)$
33. $(7 - 2y)(7 + 2y)$
34. $(y^2 + 1)(y^2 - 1)$
35. $(x + 3)^2$
36. $(3y + 4)^2$
37. $(y - 1)^2$
38. $(5y - 2)^2$
39. $(x^2 + 4)^2$
40. $(x^2 + 4)(x^2 - 4)$
41. $(x^2 + 4)(x^2 - 5)$
42. Write a polynomial in descending powers of x that represents the area of the shaded region.



43. The parking garage shown in the figure in the next column measures 30 yards by 20 yards. The length and the width are each increased by a fixed amount, x yards. Write a trinomial that describes the area of the expanded garage.



44. Evaluate $2x^3y - 4xy^2 + 5y + 6$ for $x = -1$ and $y = 2$.
45. Determine the coefficient of each term, the degree of each term, and the degree of the polynomial:
$4x^2y + 9x^3y^2 - 17x^4 - 12$.

In Exercises 46–55, perform the indicated operations.

46. $(7x^2 - 8xy + y^2) + (-8x^2 - 9xy + 4y^2)$

47. $(13x^3y^2 - 5x^2y - 9x^2) - (11x^3y^2 - 6x^2y - 3x^2 + 4)$

48. $(-7x^2y^3)(5x^4y^6)$

49. $5ab^2(3a^2b^3 - 4ab)$

50. $(x + 7y)(3x - 5y)$

51. $(4xy - 3)(9xy - 1)$

52. $(3x + 5y)^2$

53. $(xy - 7)^2$

54. $(7x + 4y)(7x - 4y)$

55. $(a - b)(a^2 + ab + b^2)$

In Exercises 56–62, simplify each expression.

56. $\dfrac{6^{40}}{6^{10}}$

57. $\dfrac{x^{18}}{x^3}$

58. $(-10)^0$

59. -10^0

60. $400x^0$

61. $\left(\dfrac{x^4}{2}\right)^3$

62. $\left(\dfrac{-3}{2y^6}\right)^4$

In Exercises 63–67, divide and check each answer.

63. $\dfrac{-15y^8}{3y^2}$

64. $\dfrac{40x^8y^6}{5xy^3}$

65. $\dfrac{18x^4 - 12x^2 + 36x}{6x}$

66. $\dfrac{30x^8 - 25x^7 - 40x^5}{-5x^3}$

67. $\dfrac{27x^3y^2 - 9x^2y - 18xy^2}{3xy}$

In Exercises 72–76, write each expression with positive exponents only and then simplify.

72. 7^{-2}

73. $(-4)^{-3}$

74. $2^{-1} + 4^{-1}$

75. $\dfrac{1}{5^{-2}}$

76. $\left(\dfrac{2}{5}\right)^{-3}$

In Exercises 77–85, simplify each exponential expression. Assume that variables in denominators do not equal zero.

77. $\dfrac{x^3}{x^9}$

78. $\dfrac{30y^6}{5y^8}$

79. $(5x^{-7})(6x^2)$

80. $\dfrac{x^4 \cdot x^{-2}}{x^{-6}}$

81. $\dfrac{(3y^3)^4}{y^{10}}$

82. $\dfrac{y^{-7}}{(y^4)^3}$

83. $(2x^{-1})^{-3}$

84. $\left(\dfrac{x^7}{x^4}\right)^{-2}$

85. $\dfrac{(y^3)^4}{(y^{-2})^4}$

In Exercises 86–88, write each number in decimal notation without the use of exponents.

86. 2.3×10^4

87. 1.76×10^{-3}

88. 9×10^{-1}

In Exercises 89–92, write each number in scientific notation.

89. 73,900,000

90. 0.00062

91. 0.38

92. 3.8

In Exercises 93–95, perform the indicated computation. Write the answers in scientific notation.

93. $(6 \times 10^{-3})(1.5 \times 10^6)$

94. $\dfrac{2 \times 10^2}{4 \times 10^{-3}}$

95. $(4 \times 10^{-2})^2$

96. A microsecond is 10^{-6} second and a nanosecond is 10^{-9} second. How many nanoseconds make a microsecond?

97. The world's population is approximately 6.3×10^9 people. Current projections double this population in 40 years. Write the population 40 years from now in scientific notation.

1. binomial, 4 2. trinomial, 2 3. monomial, 1 4. $8x^3 + 10x^2 - 20x - 4$ 5. $13y^3 - 8y^2 + 7y - 5$ 6. $11y^2 - 4y - 4$
7. $8x^4 - 5x^3 + 6$ 8. $-14x^4 - 13x^2 + 16x$ 9. $7y^4 - 5y^3 + 3y^2 - y - 4$ 10. $3x^2 - 7x + 9$ 11. $10x^3 - 9x^2 + 2x + 11$
12. 1451; 1451 per 100,000 is the death rate for men averaging 10 hr of sleep each night. 13. x^{23} 14. y^{14} 15. x^{100}
16. $100y^2$ 17. $-64x^{30}$ 18. $50x^4$ 19. $-36y^{11}$ 20. $30x^{12}$ 21. $21x^3 + 63x$ 22. $20x^5 - 55x^4$ 23. $-21y^4 + 9y^3 - 18y^2$
24. $16y^8 - 20y^7 + 2y^5$ 25. $x^3 - 2x^2 - 13x + 6$ 26. $12y^3 + y^2 - 21y + 10$ 27. $3y^3 - 17y^2 + 41y - 35$
28. $8x^4 + 8x^3 - 18x^2 - 20x - 3$ 29. $x^2 + 8x + 12$ 30. $6y^2 - 7y - 5$ 31. $4x^4 - 14x^2 + 6$ 32. $25x^2 - 16$
33. $49 - 4y^2$ 34. $y^4 - 1$ 35. $x^2 + 6x + 9$ 36. $9y^2 + 24y + 16$ 37. $y^2 - 2y + 1$ 38. $25y^2 - 20y + 4$
39. $x^4 + 8x^2 + 16$ 40. $x^4 - 16$ 41. $x^4 - x^2 - 20$ 42. $x^2 + 7x + 12$ 43. $x^2 + 50x + 600$ yd^2 44. 28

45. polynomial degree: 5;

Term	Coefficient	Degree
$4x^2y$	4	3
$9x^3y^2$	9	5
$-17x^4$	-17	4
-12	-12	0

46. $-x^2 - 17xy + 5y^2$ 47. $2x^3y^2 + x^2y - 6x^2 - 4$ 48. $-35x^6y^9$ 49. $15a^3b^5 - 20a^2b^3$ 50. $3x^2 + 16xy - 35y^2$
51. $36x^2y^2 - 31xy + 3$ 52. $9x^2 + 30xy + 25y^2$ 53. $x^2y^2 - 14xy + 49$ 54. $49x^2 - 16y^2$ 55. $a^3 - b^3$ 56. 6^{30} 57. x^{15}
58. 1 59. -1 60. 400 61. $\dfrac{x^{12}}{8}$ 62. $\dfrac{81}{16y^{24}}$ 63. $-5y^6$ 64. $8x^7y^3$ 65. $3x^3 - 2x + 6$ 66. $-6x^5 + 5x^4 + 8x^2$
67. $9x^2y - 3x - 6y$ 68. $2x + 7$ 69. $x^2 - 3x + 5$ 70. $x^2 + 5x + 2 + \dfrac{7}{x - 7}$ 71. $y^2 + 3y + 9$ 72. $\dfrac{1}{7^2} = \dfrac{1}{49}$ 73. $\dfrac{1}{(-4)^3} = -\dfrac{1}{64}$
74. $\dfrac{1}{2^1} + \dfrac{1}{4^1} = \dfrac{1}{2} + \dfrac{1}{4} = \dfrac{3}{4}$ 75. $5^2 = 25$ 76. $\dfrac{5^3}{2^3} = \dfrac{125}{8}$ 77. $\dfrac{1}{x^6}$ 78. $\dfrac{6}{y^2}$ 79. $\dfrac{30}{x^5}$ 80. x^8 81. $81y^2$ 82. $\dfrac{1}{y^{19}}$
83. $\dfrac{x^3}{8}$ 84. $\dfrac{1}{x^6}$ 85. y^{20} 86. 23,000 87. 0.00176 88. 0.9 89. 7.39×10^7 90. 6.2×10^{-4} 91. 3.8×10^{-1} 92. 3.8×10^0
93. 9×10^3 94. 5×10^4 95. 1.6×10^{-3} 96. 1000 nanosec 97. 1.26×10^{10} people