

# EXAM 1 REVIEW

## Math 0200 – Spring 2007

The first exam will be on Monday, January 29.

The exam will cover Chapter 1

Homework from all of Chapter 1 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 “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.

In Exercises 1–2, convert each mixed number to an improper fraction.

1.  $3\frac{2}{7}$

2.  $5\frac{9}{11}$

In Exercises 3–4, convert each improper fraction to a mixed number.

3.  $\frac{17}{9}$

4.  $\frac{27}{5}$

In Exercises 5–7, identify each natural number as prime or composite. If the number is composite, find its prime factorization.

5. 60

6. 63

7. 67

In Exercises 8–9, simplify each fraction by reducing it to its lowest terms.

8.  $\frac{15}{33}$

9.  $\frac{40}{75}$

In Exercises 10–15, perform the indicated operation. Where possible, reduce the answer to its lowest terms.

10.  $\frac{3}{5} \cdot \frac{7}{10}$

11.  $\frac{4}{5} \div \frac{3}{10}$

12.  $1\frac{2}{3} + 6\frac{2}{3}$

13.  $\frac{2}{9} + \frac{4}{9}$

14.  $\frac{5}{6} + \frac{7}{9}$

15.  $\frac{3}{4} - \frac{2}{15}$

16. The gas tank of a car is filled to its capacity. The first day,  $\frac{1}{4}$  of the tank's gas is used for travel. The second day,  $\frac{1}{3}$  of the tank's original amount of gas is used for travel. What fraction of the tank is filled with gas at the end of the second day?

In Exercises 17–18, graph each real number on a number line.

17.  $-2.5$

18.  $4\frac{3}{4}$

In Exercises 19–20, express each rational number as a decimal.

19.  $\frac{5}{8}$

20.  $\frac{3}{11}$

21. Consider the set

$$\left\{-17, -\frac{9}{13}, 0, 0.75, \sqrt{2}, \pi, \sqrt{81}\right\}$$

List all numbers from the set that are: a. natural numbers, b. whole numbers, c. integers, d. rational numbers, e. irrational numbers, f. real numbers.

22. Give an example of an integer that is not a natural number.

23. Give an example of a rational number that is not an integer.

24. Give an example of a real number that is not a rational number.

In Exercises 25–28, insert either  $<$  or  $>$  in the shaded area between each pair of numbers to make a true statement.

25.  $-93$      $17$                       26.  $-2$      $-200$

27.  $0$      $-\frac{1}{3}$                       28.  $-\frac{1}{4}$      $-\frac{1}{5}$

In Exercises 29–30, determine whether each inequality is true or false.

29.  $-13 \geq -11$                       30.  $-126 \leq -126$

In Exercises 31–32, find each absolute value.

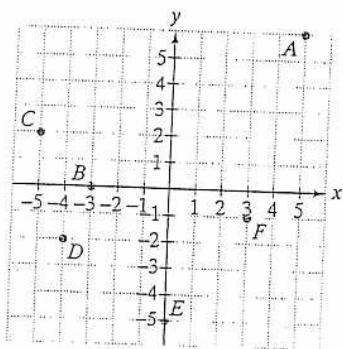
31.  $|-58|$                               32.  $|2.75|$

In Exercises 33–36, plot the given point in a rectangular coordinate system. Indicate in which quadrant each point lies.

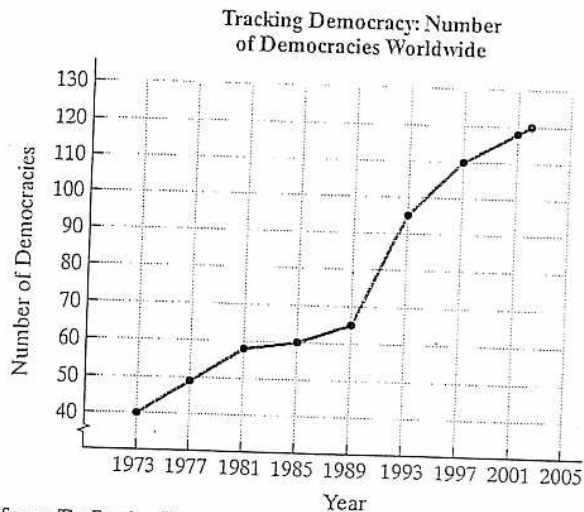
33.  $(1, -5)$                               34.  $(4, -3)$

35.  $\left(\frac{7}{2}, \frac{3}{2}\right)$                               36.  $(-5, 2)$

37. Give the ordered pairs that correspond to the points labeled in the figure.

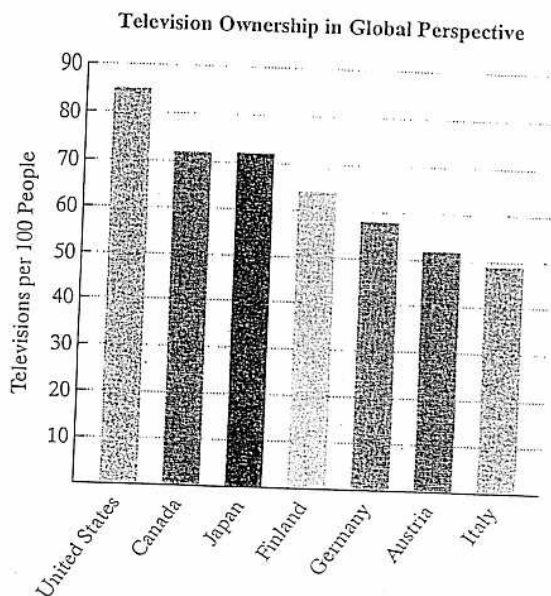


We live in an era of democratic aspiration. The number of democracies worldwide is on the rise. The line graph shows the number of democracies worldwide, in four-year periods, from 1973 through 2001, including 2002. Use the graph to solve Exercises 38–42.



38. Find an estimate for the number of democracies in 1989.
39. How many more democracies were there in 2002 than in 1973?
40. In which four-year period did the number of democracies increase at the greatest rate?
41. In which four-year period did the number of democracies increase at the slowest rate?
42. In which year were there 49 democracies?

The United States has the highest rate of television ownership in the world. The bar graph shows the seven countries in the world with the greatest number of televisions per 100 people. Use the graph to solve Exercises 43–44.



43. Estimate the number of televisions per 100 people in the United States.

44. Which countries have more than 50 but fewer than 70 televisions per 100 people?

In Exercises 45–46, evaluate each algebraic expression for the given value of the variable.

45.  $7x + 3$ ;  $x = 10$       46.  $5(x - 4)$ ;  $x = 12$

47. Use the commutative property of addition to write an equivalent algebraic expression:  $7 + 13y$ .

48. Use the commutative property of multiplication to write an equivalent algebraic expression:  $9(x + 7)$ .

In Exercises 49–50, use an associative property to rewrite each algebraic expression. Then simplify the resulting algebraic expression.

49.  $6 + (4 + y)$

50.  $7(10x)$

51. Use the distributive property to rewrite without parentheses:  $6(4x - 2 + 5y)$ .

In Exercises 52–53, simplify each algebraic expression.

52.  $4a + 9 + 3a - 7$

53.  $6(3x + 4) + 5(2x - 1)$

54. Suppose that a store is selling all computers at 25% off the regular price. If  $x$  is the regular price, the algebraic expression  $x - 0.25x$  describes the sale price. Evaluate the expression when  $x = 2400$ . Describe what the answer means in practical terms.

55. Use a number line to find the sum:  $-6 + 8$ .

In Exercises 56–58, find each sum without the use of a number line.

56.  $8 + (-11)$       57.  $-\frac{3}{4} + \frac{1}{5}$

58.  $7 + (-5) + (-13) + 4$

In Exercises 59–60, simplify each algebraic expression.

59.  $8x + (-6y) + (-12x) + 11y$

60.  $10(4 - 3y) + 28y$

61. The Dead Sea is the lowest elevation on Earth, 1312 feet below sea level. If a person is standing 512 feet above the Dead Sea, what is that person's elevation?

62. The water level of a reservoir is measured over a five-month period. At the beginning, the level is 25 feet. During this time, the level fell 3 feet, then rose 2 feet, then rose 1 foot, then fell 4 feet, and then rose 2 feet. What is the reservoir's water level at the end of the five months?

63. Rewrite  $9 - 13$  as the addition of an additive inverse.

In Exercises 64–66, perform the indicated subtraction.

64.  $-9 - (-13)$       65.  $-\frac{7}{10} - \frac{1}{2}$

66.  $-3.6 - (-2.1)$

In Exercises 67–68, simplify each series of additions and subtractions.

67.  $-7 - (-5) + 11 - 16$

68.  $-25 - 4 - (-10) + 16$

69. Simplify:  $3 - 6a - 8 - 2a$ .

70. What is the difference in elevation between a plane flying 26,500 feet above sea level and a submarine traveling 650 feet below sea level?

In Exercises 71–73, perform the indicated multiplication.

71.  $-7(-12)$       72.  $\frac{3}{5} \left( -\frac{5}{11} \right)$

73.  $5(-3)(-2)(-4)$

In Exercises 74–76, perform the indicated division or state that the expression is undefined.

74.  $\frac{45}{-5}$       75.  $-17 \div 0$

76.  $-\frac{4}{5} \div \left( -\frac{2}{5} \right)$

In Exercises 77–78, simplify each algebraic expression.

77.  $-4 \left( -\frac{3}{4}x \right)$       78.  $-3(2x - 1) - (4 - 5x)$

In Exercises 79–81, evaluate each exponential expression.

79.  $(-6)^2$       80.  $-6^2$       81.  $(-2)^5$

In Exercises 82–83, simplify each algebraic expression, or explain why the expression cannot be simplified.

82.  $4x^3 + 2x^3$       83.  $4x^3 + 4x^2$

In Exercises 84–92, use the order of operations to simplify each expression.

84.  $-40 \div 5 \cdot 2$       85.  $-6 + (-2) \cdot 5$

86.  $6 - 4(-3 + 2)$       87.  $28 \div (2 - 4^2)$

88.  $36 - 24 \div 4 \cdot 3 - 1$       89.  $-8[-4 - 5(-3)]$

90.  $\frac{6(-10 + 3)}{2(-15) - 9(-3)}$       91.  $\left( \frac{1}{2} + \frac{1}{3} \right) \div \left( \frac{1}{4} - \frac{3}{8} \right)$

92.  $\frac{1}{2} - \frac{2}{3} \div \frac{5}{9} + \frac{3}{10}$

In Exercises 93–94, evaluate each algebraic expression for the given value of the variable.

93.  $x^2 - 2x + 3$ ;  $x = -1$

94.  $-x^2 - 7x$ ;  $x = -2$

In Exercises 95–96, simplify each algebraic expression.

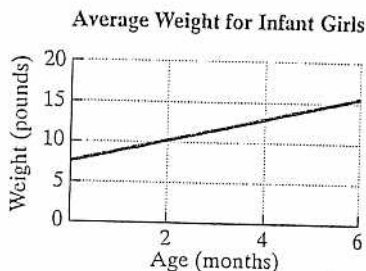
95.  $4[7(a - 1) + 2]$

96.  $-6[4 - (y + 2)]$

On the average, infant girls weigh 7 pounds at birth and gain 1.5 pounds for each month for the first six months. The formula

$$W = 1.5x + 7$$

models a baby girl's weight,  $W$ , in pounds, after  $x$  months, where  $x$  is less than or equal to 6. Use the formula to solve Exercises 97–98.



97. What does an infant girl weigh after four months? Identify your computation as an appropriate point on the line graph.

98. What does an infant girl weigh after six months? Identify your computation as an appropriate point on the line graph.

1.  $\frac{23}{7}$    2.  $\frac{64}{11}$    3.  $1\frac{8}{9}$    4.  $5\frac{2}{5}$

5.  $2 \cdot 2 \cdot 3 \cdot 5$    6.  $3 \cdot 3 \cdot 7$

7. prime

8.  $\frac{5}{11}$

9.  $\frac{8}{15}$

10.  $\frac{21}{50}$

11.  $\frac{8}{3}$

12.  $\frac{1}{4}$

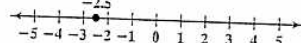
13.  $\frac{2}{3}$

14.  $\frac{29}{18}$

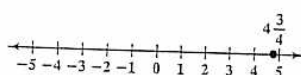
15.  $\frac{37}{60}$

16.  $\frac{5}{12}$

17.



18.



19. 0.625

20.  $0.\overline{27}$

21. a.  $\sqrt{81}$    b.  $0, \sqrt{81}$    c.  $-17, 0, \sqrt{81}$

d.  $-17, -\frac{9}{13}, 0, 0.75, \sqrt{81}$

e.  $\sqrt{2}, \pi$

f.  $-17, -\frac{9}{13}, 0, 0.75, \sqrt{2}, \pi, \sqrt{81}$

22. Answers will vary;  $-2$  is an example.

23. Answers will vary;  $\frac{1}{2}$  is an example.

24. Answers will vary;  $\pi$  is an example.

25.  $<$    26.  $>$

27.  $>$

28.  $<$

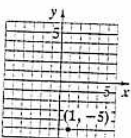
29. false

30. true

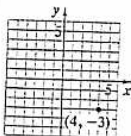
31. 58

32. 2.75

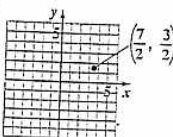
33. IV



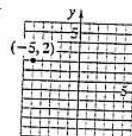
34. IV



35. I



36. II



37.  $A(5, 6)$ ;  $B(-3, 0)$ ;  $C(-5, 2)$ ;  $D(-4, -2)$ ;  $E(0, -5)$ ;  $F(3, -1)$

38. 65

39. 80

40. 1989–1993

41. 1981–1985

42. 1977

43. 85

44. Finland, Germany, Austria

45. 73

46. 40

47.  $13y + 7$

48.  $(x + 7)9$

49.  $(6 + 4) + y = 10 + y$

50.  $(7 \cdot 10)x = 70x$

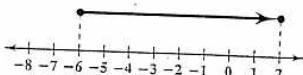
51.  $24x - 12 + 30y$

52.  $7a + 2$

53.  $28x + 19$

54. 1800; The sale price at 25% off is \$1800 for a \$2400 computer.

55. 2



56.  $-3$

57.  $-\frac{11}{20}$

58.  $-7$

59.  $5y - 4x$

60.  $40 - 2y$

61. 800 ft below sea level

62. The reservoir's level at the end of 5 months is 23 ft.

63.  $9 + (-13)$

64. 4

65.  $-\frac{6}{5}$

66.  $-1.5$

67.  $-7$

68.  $-3$

69.  $-5 - 8a$

70. 27,150 ft

71. 84

72.  $-\frac{3}{11}$

73.  $-120$

74.  $-9$

75. undefined

76. 2

77.  $3x$

78.  $-x - 1$

79. 36

80.  $-36$

81.  $-32$

82.  $6x^3$

83. cannot be simplified

84.  $-16$

85.  $-16$

86. 10

87.  $-2$

88. 17

89.  $-88$

90. 14

91.  $-\frac{20}{3}$

92.  $-\frac{2}{5}$

93. 6

94. 10

95.  $28a - 20$

96.  $6y - 12$

97. 13 lb; (4, 13)

98. 16 lb; (6, 16)

99. 805 million; fairly well, but slight overestimation

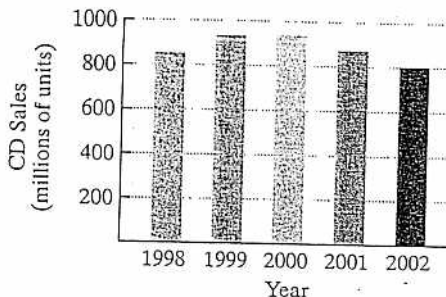
100. Sales increase from 1998 to 2000 and decrease from 2000 to 2002.

Among people under 40, opinions are split on downloading music: 45% think it's stealing, while 46% think it's not. (Source: Newsweek, September 22, 2003) Downloading and music CD prices that remained high through 2003 resulted in the decline of CD sales shown in the bar graph. The data can be modeled by the formula

$$N = -26x^2 + 143x + 740,$$

where  $N$  represents the number of music CD sales, in millions,  $x$  years after 1997. Use the formula to solve Exercises 99–100.

Music CD Sales in the U.S.



Source: RIAA

99. According to the formula, how many millions of CDs were sold in 2002? How well does the formula describe sales for that year shown by the bar graph?

100. What do you notice about CD sales from 1998 through 2002 from the bar graph that is not obvious by looking at the formula?