

EXAM 2 REVIEW

Math 200 – Fall 2006

The second exam will be on Tuesday, Sept 19.

The exam will cover Chapter 2

All homework from Chapter 2 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.

CHAPTER 2 REVIEW EXERCISES

In Exercises 30–34, solve each formula for the specified variable.

Solve each equation in Exercises 1–5 using the addition property of equality. Be sure to check proposed solutions.

- $x - 10 = 22$
- $-14 = y + 8$
- $7z - 3 = 6z + 9$
- $4(x + 3) = 3x - 10$
- $6x - 3x - 9 + 1 = -5x + 7x - 3$

Solve each equation in Exercises 6–13 using the multiplication property of equality. Be sure to check proposed solutions.

- $\frac{x}{8} = 10$
- $\frac{y}{-8} = 7$
- $7z = 77$
- $-36 = -9y$
- $\frac{3}{5}x = -9$
- $30 = -\frac{5}{2}y$
- $-x = 25$
- $\frac{-x}{10} = -1$

Solve each equation in Exercises 14–18 using both the addition and multiplication properties of equality. Check proposed solutions.

- $4x + 9 = 33$
- $-3y - 2 = 13$
- $5z + 20 = 3z$
- $5x - 3 = x + 5$
- $3 - 2x = 9 - 8x$

19. The formula $F = 1.2x + 21.6$ models the average family income, F , in thousands of dollars, for Puerto Ricans x years after 1990. How many years after 1990 is the average family income expected to reach \$40.8 thousand? In which year is this expected to occur?

Solve and check each equation in Exercises 20–28.

- $5x + 9 - 7x + 6 = x + 18$
- $3(x + 4) = 5x - 12$
- $1 - 2(6 - y) = 3y + 2$
- $2(x - 4) + 3(x + 5) = 2x - 2$
- $-2(y - 4) - (3y - 2) = -2 - (6y - 2)$
- $\frac{2x}{3} = \frac{x}{6} + 1$
- $\frac{x}{2} - \frac{1}{10} = \frac{x}{5} + \frac{1}{2}$
- $3(8x - 1) = 6(5 + 4x)$
- $4(2x - 3) + 4 = 8x - 8$
- The optimum heart rate that a person should achieve during exercise for the exercise to be most beneficial is modeled by $r = 0.6(220 - a)$, where a represents a person's age and r represents that person's optimum heart rate, in beats per minute. If the optimum heart rate is 120 beats per minute, how old is that person?

$$30. I = Pr \text{ for } r \qquad 31. V = \frac{1}{3}Bh \text{ for } h$$

$$32. P = 2l + 2w \text{ for } w$$

$$33. A = \frac{B + C}{2} \text{ for } B$$

$$34. T = D + pm \text{ for } m$$

In Exercises 35–36, express each decimal as a percent.

- 0.72
- 0.0035

In Exercises 37–39, express each percent as a decimal.

- 65%
- 150%
- 3%
- What is 8% of 120?

41. 90 is 45% of what?

42. 36 is what percent of 75?

43. If 6 is increased to 12, the increase is what percent of the original number?

44. If 5 is decreased to 3, the decrease is what percent of the original number?

45. A college that had 40 students for each lecture course increased the number to 45 students. What is the percent increase in the number of students in a lecture course?

46. Consider the following statement:

My portfolio fell 10% last year, but then it rose 10% this year, so at least I recouped my losses.

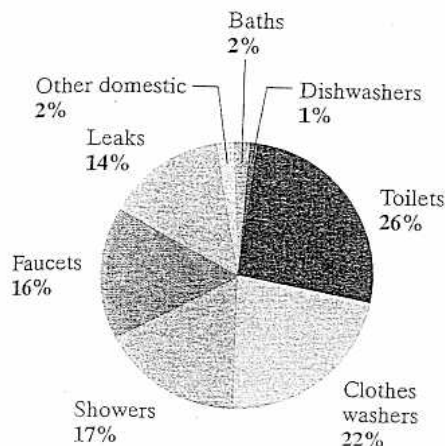
Is this statement true? In particular, suppose you invested \$10,000 in the stock market last year. How much money would be left in your portfolio with a 10% fall and then a 10% rise? If there is a loss, what is the percent decrease, to the nearest tenth of a percent, in your portfolio?

47. The radius is one of two bones that connect the elbow and the wrist. The formula $r = \frac{h}{7}$ models the length of a woman's radius, r , in inches, and her height, h , in inches.

- Solve the formula for h .
- Use the formula in part (a) to find a woman's height if her radius is 9 inches long.

48. Every day, the average U.S. household uses 91 gallons of water flushing toilets. The circle graph on the next page shows that this represents 26% of the total number of gallons of water used per day. How many gallons of water does the average U.S. household use per day?

Where U.S. Households Use Water



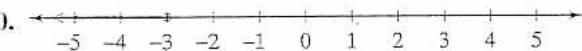
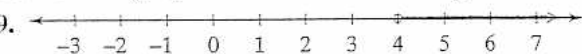
In Exercises 49–56, use the five-step strategy to solve each problem.

49. Six times a number, decreased by 20, is four times the number. Find the number.
50. On average, the number of unhealthy air days per year in Los Angeles exceeds three times that of New York City by 48 days. If Los Angeles and New York combined have 268 unhealthy air days per year, determine the number of unhealthy days for the two cities.
(Source: Environmental Protection Agency)
51. Two pages that face each other in a book have 93 as the sum of their page numbers. What are the page numbers?
52. The two female artists in the United States with the most platinum albums are Barbra Streisand followed by Madonna. (A platinum album represents one album sold per 266 people.) The number of platinum albums by these two singers form consecutive odd integers. Combined, they have 96 platinum albums. Determine the number of platinum albums by Streisand and the number of platinum albums by Madonna.
53. In 2003, the average weekly salary for workers in the United States was \$612. If this amount is increasing by \$15 yearly, in how many years after 2003 will the average salary reach \$747? In which year will that be?
54. A bank's total monthly charge for a checking account is \$6 plus \$0.05 per check. If your total monthly charge is \$6.90, how many checks did you write during that month?
55. A rectangular field is three times as long as it is wide. If the perimeter of the field is 400 yards, what are the field's dimensions?
56. After a 25% reduction, you purchase a table for \$180. What was the table's price before the reduction?

In Exercises 57–58, graph the solution of each inequality on a number line.

57. $x < -1$ 58. $-2 < x \leq 4$

Describe each graph in Exercises 59–60 using set-builder notation.



Solve each inequality in Exercises 61–68. Express the solution set in set-builder notation and graph the set on a number line. If the inequality has no solution or is true for all real numbers, so state. It is not necessary to graph solution sets for these inequalities. See graphing answer section.

61. $2x - 5 < 3$
62. $\frac{x}{2} > -4$
63. $3 - 5x \leq 18$
64. $4x + 6 < 5x$
65. $6x - 10 \geq 2(x + 3)$
66. $4x + 3(2x - 7) \leq x - 3$
67. $2(2x + 4) > 4(x + 2) - 6$
68. $-2(x - 4) \leq 3x + 1 - 5x$

69. To pass a course, a student must have an average on three examinations of at least 60. If a student scores 42 and 74 on the first two tests, what must be earned on the third test to pass the course?
70. A long distance telephone service charges 10¢ for the first minute and 5¢ for each minute thereafter. The cost, C , in cents, for a call lasting x minutes is modeled by the formula

$$C = 10 + 5(x - 1).$$

How many minutes can you talk on the phone if you do not want the cost to exceed \$5, or 500¢?

Review Exercises

1. 32 2. -22 3. 12 4. -22 5. 5 6. 80 7. -56 8. 11 9. 4 10. -15 11. -12 12. -25 13. 10 14. 6
15. -5 16. -10 17. 2 18. 1 19. 16 yr; 2006 20. -1 21. 12 22. -13 23. -3 24. -10 25. 2 26. 2
27. no solution 28. all real numbers 29. 20 yr old 30. $r = \frac{I}{P}$ 31. $h = \frac{3V}{B}$ 32. $w = \frac{P - 2l}{2}$ 33. $B = 2A - C$
34. $m = \frac{T - D}{P}$ 35. 72% 36. 0.35% 37. 0.65 38. 1.5 39. 0.03 40. 9.6 41. 200 42. 48% 43. 100% 44. 40%
45. 12.5% 46. no; 1% 47. a. $h = 7r$ b. 5 ft 3 in. 48. 350 gallons 49. 10 50. New York: 55 days; Los Angeles: 213 days
51. pages 46 and 47 52. Streisand: 49 albums; Madonna: 47 albums 53. 9 yr; 2012 54. 18 checks 55. length: 150 yd; width: 50 yd 56. \$240
57. 58. 59. $\{x | x > 4\}$ 60. $\{x | x \leq -3\}$

61. $\{x | x < 4\}$ 62. $\{x | x > -8\}$
63. $\{x | x \geq -3\}$ 64. $\{x | x > 6\}$
65. $\{x | x \geq 4\}$ 66. $\{x | x \leq 2\}$ 67. $\{x | x \text{ is a real number}\}$
68. no solution; \emptyset 69. at least 64 70. no more than 99 min