

Chapter Six Test

Class _____ Name _____

All numeric answers must have an error ≤ 0.01 .

Solve the equations in Exercises 1 - 5.

1. $2.3x - 1.9x + 7.4 = 0$ 1. _____

2. $4(x - 1) - 3(x - 5) = 6(x - 2) + 13$ 2. _____

3. $(\sqrt{3})x - 7 = 0$ 3. _____

4. $5(x - 2) = 5x - 3$ 4. _____

5. $0 = \pi x - 3$ 5. _____

Solve the inequalities/equations in Exercises 6 - 14, use interval notation to describe the answers to inequalities.

6. $-8x + 32 < 0$ 6. _____

7. $2.5x - 13.1 \geq 0$

7. _____

8. $-3(x - 2) + 5 \leq 4(x + 1) - 7$

8. _____

9. $-0.012(x + 3.0001) > 0$

9. _____

10. $-3 \leq 5x - 3 \leq 0$

10. _____

11. $-2|x - 3| + 5 < 0$

11. _____

12. $-2|x - 3| + 5 \geq 0$

12. _____

13. $3.2|x - 5.2| = 4.1$

13. _____

14. $4 > -1|x - 3| + 2$

14. _____

15. If g varies directly with t , and t is 30 when g is 240, find g when t is 15.

15. _____

16. Isolate x_2 in $A = \frac{x_1 + x_2}{2}$.

16. _____

17. Isolate m in $y = mx + b$

17. _____

The cost of producing electric power from windmills is about 8.1 cents or \$0.081 per kilowatt-hour. If the meter fee is \$12.50 per month, y is your total monthly electric bill in dollars, and x is the monthly kilowatt-hours you used, answer the following questions.

18. What linear mathematical model can be used to calculate your monthly electric bill?

18. _____

19. If you use 2100 kilowatt-hours during the month, what is the electric bill?

19. _____

20. How much electricity will you get for a total monthly bill of \$156?

20. _____

Teacher Notes:

This test comes from Chapter Six, which is on solving equations and inequalities. *Foundations 3e* implements teaching and learning of algebra through the use of “a function approach.” As such, equation solving is placed after students learn about functions and function behaviors, which are taught in Chapters Two and Three, and revisited in several other chapters. One of the characteristics of functions is the “zeros” behavior. Likewise, students have learned to find when functions are positive, or negative – all with a graphing calculator. When students know how to find the behaviors for **any** function of being positive, negative, or zero, they are ready to solve equations using these behaviors. In addition to knowing the function behaviors, students have also graphed many many functions such as linear, quadratic, exponential, absolute value, and square root before they are asked to solve equations.

In Chapter Six, we teach four function-based methods for solving any equation (inequality), and one pencil-and-paper method for solving linear equations and absolute value equations (inequalities). The methods taught in sequential order are: trace, numerical, zeros, intersection, and pencil-and-paper. The pencil-and-paper method is taught using an activity based on the intersection method. That is, the properties of equality are developed through the use of the intersection method embedded in pattern-building.

You will note that at no time do the test directions specify a particular method for solving the equation or inequality. While students are given the choice of methods, if they use one of the graphing calculator-based methods on every equation or inequality, they will not finish the test. That is, we want students to solve the equation $0 = \pi x - 3$ mentally or with pencil and paper. When students use a graphing calculator for those equations that are best done mentally or with pencil and paper find that they do not finish the test.