



Jakarta
International
School
7th Grade

Name: _____

Date: _____

Score:

40

Practice Test - Black

Solving Multi-Step
Equations

Do all of your work on a separate piece of paper. Show your work for full value.

1. Twenty is decreased by the quotient of the product of four and a number all squared, and the product of two and the same number. This is all then decreased by twenty-seven and equates to negative one.

a) Translate the sentence into an algebraic equation. (1pt)

b) Solve the equation, show all working and complete a check. (2pts)

2. For what value of x does $3^{2x^2-5x+2} = 3^{2x^2+7x-4}$?? Express your answer as a common fraction. (2pts)

3. The sum of 40 consecutive integers is 100. What is the largest of these 40 integers? (2pts)

4. For the following problem, complete the 4 step problem solving process. (4pts)

1. Define a variable

2. Write an equation

3. Find the solution and write your answer in a meaningful way

4. Check your solution

a) A student is asked his age, and he responds, "My age is nine less than half my teacher's age. The teacher is asked his age, and he responds, "my age is three times my student's age." Find the age of the student.

5. For problems a) and b), solve. If the equation is an identity or has no solution, write an appropriate conclusion. (4pts)

a) $5 + 2x - 9 = 7x - 4 - 5x$

b) $3(x - 4) - x = 2(x - 6)$

6. Solve for the variable indicated. State any restrictions on possible values of the variables. (2pts) $t = x + xy; x$

7. **Digits Problem:** The tens digit of a two-digit number is 1 less than five times the unit digit. The square of the unit digit is 5 less than the tens digit. Find the number. (3pts)

8. **Bathtub Problem** Suppose that you turn on the hot water, which flows at 8.7 liters per minute into the bathtub. Two minutes later you also turn on the cold water, which flows at 13.2 liters per minute. Let x be the number of minutes since you turned on the cold water. (4pts)

a) Write an equation stating that the hot and cold faucets have delivered the *same* number of liters. Solve the equation to find out when this happens.

b) The tub holds 100 liters. Will it have overflowed by the time the hot and cold faucets have delivered the same amounts? Justify your answer.

9. **Coin Problem:** Ten nickels and quarters have a total value of \$1.70. How many of each are there? (nickel = \$0.05, quarter = \$0.25) (2pts)

10. If $x+y=12$ and $x-y=8$, what is the value of $2x-xy$? (2pts)

11. Football Tickets Problem

Suppose that you are collecting tickets at a football game. Reserved seat tickets cost \$4.00 each and general admission tickets costs \$3.00 each. After the game is over, the turnstile count shows that 1787 people paid admission. You count a total of \$5792 from the sale of tickets. You are just about ready to leave for your postgame date when your boss says, "By the way, how many of each kind of

ticket were there?" Rather than spending half an hour sorting and counting all the ticket stubs, you decide to use algebra. What do you tell your boss? (2pts)

12. Pedalboat Problem: Eb and Flo are pedalboating on the San Antonio River. Going downstream their speed is 40 meters per minute (m/min). Coming back upstream their speed is only 26 m/min. How fast do they move through the water? How fast is the current going? (2pts)

13. Gertrude and Bertha are sisters. They are responsible for keeping the family's driveway clear of snow. If they work together they can complete the shoveling in 30 minutes. One day Gertrude had to do the job alone. It took her 40 minutes. How long would it have taken Bertha to shovel the same amount alone? You can assume that each girl always shovels at a constant speed. (2pts)

14. Do this question on graph paper. Use the system: $x + 2y = 8$
 $5x - 2y = 6$

- Graph both equations on the same coordinate system by finding the x- and y-intercepts. (2pts)
- Read the intersection point of the two graphs to 0.1 unit. (1pt)
- Solve the system of equations either by addition-subtraction or by substitution. (2pts)
- Show that the answer agrees with the one you found by graphing. (1pt)