Appendix E

Math Review

If you need a review or feel challenged by any of the retail math calculations or formulas in the book, it may be helpful to review some concepts of basic algebra, probability, percent and word problems. The following questions illustrate some of the problems you may encounter as you conduct your own data analysis.

# Basic Algebra: Order of Operations

To solve order of operation problems the acronym Please Excuse My Dear Aunt Sally (PEMDAS) is used. Therefore, the order used to solve these problems is using Parentheses, Exponents, Multiplication, Division, Addition and Subtraction. When there are no parentheses solve the multiplication and division if next to each other from left to right.

1. 5\*4+3=

Here, 5 and 4 are multiplied together which produces a product of 20. Then, add 3 plus 23. Answer is 23.

1. (3+4)\*5=

Here, the parenthesis is solved first and the sum is 7. Then 7 is multiplied by 5 and the product is 35.

1. 42-1+3=

Here, multiply 4 times itself which produces 16. Then, subtract by 1 and add 3. The answer 18.

1. (3+4+2)2-1=

Here, add the numbers in the parenthesis which produces a sum of 9. Then, multiply 9 to the power of two or 9 multiplied by 9. The product is 81 and subtract 1. The answer is 80.

1. 4+(16/4)+2=

Here, do what is in the parenthesis first which is to divide 16 by 4. That equals 4. The next step would be to add from left to right: 4+4+2. The answer is 10.

1. 16/(6+2)+4=

Here, first solve the numbers in the parenthesis and the sum is 8. The next step is to divide 16 by 8 which is 2. Then, add 2+4. The answer is 6.

1. 5+16/(4+2)2=

Here, first solve the numbers in the parenthesis and the answer is 6. The next step is to multiply 6 times itself which is 36. After that, divide 16 by 36 which is 1/2. Then, add 5+0.5 and the answer is 5.5.

1. 2\*(16-22)/3=

Here, solve for the number in the parenthesis first. In order to do this,compute the multiplication of 2 times itself first, which is 4. Then do the subtraction of 16 minus 4 and the result is 12. Then, multiply and divide from left to right. Multiply 2 and 12 and divide by 3 to get the answer of 8.

1. 3\*2+9-1\*5=

Here, solve the multiplication first of 3 times 2 which equal 6 and 1 times 5 which equal 5. The next step would be to do the addition and subtraction. Solve 6 plus 9 minus 5 which is equal to 10.

1. 3\*2+(9-1)\*5=

Here, first do what is inside the parenthesis. That is 9-1=8. Then do the multiplication 3\*2=6 and 8\*5=40. Lastly, add the numbers 6+40=46. The answer is 46.

11. 7+(-3)+(-1)+5-7=

Here, Subtract 7 from -3 and -1 plus 5 minus 7. The answer is 1.

12. 5-(-3)+10-(-1)=

Here, a negative times a negative is a positive. Thus, add 5 plus 3 plus 10 plus 1 and the answer is 19.

1. -5-(-2)=

Here, same as with the last problem. A negative multiplied by a negative is a positive. Therefore, Negative 5 plus 2 is negative 3.

14. 7+(-2)-1-(-2)-(9)=

Here, try to take away all the parentheses and just add and subtract. Therefore, 7 add negative 2 the answer is 5. 5 minus 1 is 4. Four plus 2 is 6. And, 6 minus 9 the answer is negative 3.

1. -6\*(-2)\*3=

Here, a negative multiplied by a negative is a positive. Negative 6 multiplied by negative 2. Then, multiply 12 and 3 The answer is 36.

1. -4\*(-2)\*(-3)=

Here, since there are three negative numbers the result will be negative. The answer is negative 24.

17. 6\*(-5)\*(2)=

Here, the result is negative since there is only one negative number. The answer is negative 60.

18. 12/(-4)=

Here, there is only one negative number as well so the result will be negative. The answer is negative 3.

19. 20/4+40/4=

Here, this problem is straight-forward division. First do the division and then the addition. Take 5+10 The answer is 15.

1. -100/(-5)=

Here, divide two negative numbers and the answer will be positive. The answer is a positive 20.

1. 6/3\*(4-1)+7=

Here, first you solve the parentheses 4-1=3. The next step is to go from left to right to solve and solve the multiplication and division. The answer is 6/3\*3=6. Next, add 7. The answer is 13.

# Missing variable problems: Problem Solving for X

Try to put X, an unknown quantity, on one side and the other numbers on the other. Remember, whatever is added, subtracted, multiplied or divided on one side the same operation needs to be performed on the other side of the equal sign.

1. X+8=14

Here, in order to get the unknown quantity X ,on one side, and the numbers, on the other, an 8 needs to be subtracted from both sides of the equal sign. The answer is x = 6.

1. 9=X-5+6

Here, first add -5+6 which is 1. Next, 1 needs to be subtracted on the right side and added on the left of the equal sign to solve the problem. The answer is x = 8.

1. 7X=21

Here, 7 needs to be divided on both sides of the equal sign. The answer is x = 3.

1. 5+85=5X

Here, add 85+5= 90. 5 is divided on both sides of the equal sign to produce an answer x = 18.

1. 5X+6=(11\*6)

Here, multiply 11\*6, which is 66. Then, first subtract 6 from both sides and the result will be 5X = 60. Then divide both sides of the equal sign by 5 and the answer is X =12.

1. (X/2)-2=24

Here, add 2 from both sides. (x/2) = 26. Then, multiply both sides of the equation by 2. The answer will be X = 52.

1. (X+6\*2)/2=16

Here, first multiple both sides of the parentheses by 2 and the result will be X + 6\*2 = 32. Then, multiply the 6\*2 to get 12. Then, subtract both sides by 12. The answer is X =20.

1. 48=2X+1+3

Here, add the 1 and 3 to get 4. Then, subtract 4 from both sides and the result will be 44 = 2X. Next, divide 2 from both sides. The answer is 22.

1. (X-3\*2)/(8\*4)=2

Here, first multiply 8 and 4, which is 32. Then, multiply both sides of the equation by 32 and the result will be X-3\*2 = 64. Next, multiply negative 3 and 2 to get negative 6 and you will have x-6 = 64. Then, add 6 to both sides. The result is X = 70.

1. 19=7X-4/2

Here, divide negative 4 by 2 to get negative 2. Then, add 2 to both sides of the equal sign which produces 21 = 7X. Next, divide both sides by 7. The answer is X = 3.

1. (-9)3=X

Here, -9 is to the power of 3. This means -9 is multiplied to itself 3 times. Therefore, -9 \* -9 \* -9 equals -729. The answer is negative.

1. (-4)2=X

Here, the answer will be positive because -4 is multiplied to itself 2 times. -4 \* -4 and the answer is 16.

1. Sqrt(9)\*4= X Sqrt=square root

Here, the square-root is to the power of one half. Since 3 \* 3 = 9, the square-root of 9 is 3. Next, multiply 3 times 4 and the answer is 12.

1. (42/sqrt(4))\*5=X

Here, the square-root of 4 is equivalent to square-root of (2 \* 2). Therefore, the square-root of 4 is 2. Next, divide 42 into 2, which is 21. Next, multiply the 21 and 5 and the answer is 105.

1. Sqrt((11+2)2)=X

Here, first we need to solve what is in the parentheses. The sum of 11 plus 2 is 13. Next, multiply 13 times 13 which is 169. Then, take the sqrt of 169 and the answer is 13.

1. 42/(6/sqrt(9))=X

Here, first take the square-root of 9 which is 3. Then, do what is inside the parentheses and the answer is 6/3 which is equal to 2. Then, take 42/2 and the answer is 21.

17. (42/2)/sqrt(9)= X

This question is very similar to the last question but the parentheses are put in the numerator. Here, first do 42/2 which equals 21. And then, 21 divided by 3 yields the answer is 7.

18. (4+2)3=X

Here, first add what is in the parentheses for an answer of 6. Next, 63 is 6 \* 6 \* 6 and the answer is 216.

# Working with simple fractions, simple decimals and simple percent

Fractions and decimal problems: These problems need to be reduced to the lowest denominator.

1. 1.756+0.15+0.01=

Here, the decimal points need to be lined up and then add the numbers together. The answer is 1.916.

2. Change to a decimal: 6 5/8

6.625 Divide 5 by 8 and add 6.

3. Change to a decimal: 8 3/4

8.75 divide 3/4 which yields 0.75. Add 8 and 0.75 which equals8.75

4. (3/16)+(7/16)+(6/16)=

Here, all three fractions have the same denominator. Therefore, add the numerator together for a result of 16/16. Next, reduce for an answer of 1.

5. (3/8)+(2/7)+(10/28)=

Here, in order to add three fractions a lowest common denominator is needed. The lowest common denominator is calculated by multiplying 4 times 2 times 7 for a result of 56. The 56 will be the denominator. The denominator and the numerator will be multiplied by the same number to yield 56. Therefore, 3 times 7 is 21 and 2 times 8 is 16 and 10 times 2 is 20. This answer is (21 + 16+ 20)/56 or the answer is 57/56 or 1 1/56.

6. (7/10)-(2/5)=

Here, use 10 for the denominator. Next, multiply 2 times 2. The result is (7 - 4)/10. And, the answer is 3/10.

7. (3/5)\*(2/4)\*(6/2)=

Here, reduce. So, (3\*2\*6)/(5\*4\*2) is reduced to 9/10.

8. (1/5)/(4/3)=

Here, the denominator is flipped and multiplied by the numerator. multiply 1 times 3 which results in 3 . Next, multiply 5 times 4 which equals 20 This answer is 3/20..

9. Change to a fraction: 0.0081

0.0081 = 81/10,000 (4 spaces) There are 4 decimal places so divide by 10,000.

10. Change to a fraction: 1.69

1.69 = 169/100 (2 spaces) There are 2 decimal places so you divide by 100.

# Basic Percent Problems

1. Change this fraction 2/4 to a percent:

Here, first reduce to 1/2. Next, to convert this number to a fraction for an answer of 0.5.

2. Change 40% to a fraction:

Here, to reduce a percent to a fraction, 40 needs to be divided by 100 or 40/100. This reduces to 4/10 or an answer of 0.40.

3. Change to a percent: .0050

0.0050 X 100 = 0.50% Need to multiply by 100

4. Change this decimal 3.57 to a percent:

3.57X 100 = 357.0% Need to multiply by 100

5. Change this mixed decimal 3 7/8 to a percent

Divide 7/8 = 0.875. Add to 3 which produces 3.875. 3.875 X 100 = 387.5% Need to multiply by 100

6. Change this decimal 11/20 to a percent:

11/20 = 0.55X100 = 55% Need to divide 11 into 20 and then multiply by 100.

7. Change to a percent 54.7% to a decimal to a fraction:

54.7% =0.547= 547/1,000. First, change to a decimal. Then to a fraction.

8. Change this percent 67.78% to a decimal:

The decimal place moves two places to the left. The answer is 0.6778.