Mathematical Exercises Name:_____

Do not round answers.
Show your work!

Problems are to be submitted in either hand written or MSExcel workbook (any version) form. MSExcel is preferred to Val.Miller@nist.gov. Title the workbook file:{Your name} Balance Math Exercises {Date}.

Return the completed exercises by e-mail with the subject line "Balance Math Exercises" to aid in tracking your message.

Order of Operations, Powers & Roots
Reminder: PEMDAS

1. $10.1 + 3 \times 12 - 6.5 = $ _____

2. $6 + 18 \div 3 + 3^2 = $ _____

3. $9 + 24.3 / 8 - 5.2 = $ _____

4. $(9 + 24)/(8 - 5) = $ _____

5. $56.6 \div 2 + 6 \times 5.2 - 7 = $ _____

6. $13 + 36 \div 4 + 2 \times 3 = $ _____

7. $48 \div (2 \times 3) + 2^3 = $ _____

8. $3.25 (7 - 5 \times 2 + 6) = $ _____

Positive and Negative Numbers

9. $5 \times [(-7) - 5 + 6] = $ _____

10. $-3.25 (7 - 5 \times 2 + 6) = $ _____

11. $17 \left(-\dfrac{1}{51}\right) = $ _____

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12. $-12.25\left[3+(-2)\times\dfrac{1}{4}\right]=$ _____

13. $3\times(4\times-3)=$ _____

14. $-\dfrac{1}{(7-5\times2+6)}=$ _____

Powers and Roots

15. $0.2^2=$ _____

16. $(0.000689)^2=$ _____

17. $15^2=$ _____

18. $(0.04)^{½}=$ _____

19. $\left(\dfrac{1}{2}\right)^2=$ _____

20. $\sqrt{16+9}=$ _____

21. $\dfrac{1}{10^3}=$ _____

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Units, Conversions, and Related Problems
<mark>Use conversion factors from NIST Special Publication 811 (attached).</mark>
Use exact conversion factors.

Mass   **Note: 1 µg = 0.000 001 g = 1E-6 g = 1E-9 kg**

22. 100 g + 20 mg = _____ g

23. 100 g + 20 mg = _____ mg

24. 28.34952 g = _____ kg

25. 1237 mg = _____ g

26. 2.5 kg = _____ g

Temperature (Rewrite equation 3 to solve for ºF where necessary).

Equation 3

$$°C = \frac{°F - 32}{1.8}$$

27:    20 ºC = _____ ºF

28:    60 ºF = _____ ºC

Time taken to complete math exercises (including spreadsheet): _____ minutes