13.8 EXPONENTS REVIEW

A. Write each of the following with positive exponents.

1. 7^{-2}
2. $\frac{1}{x^{-5}}$
3. 3^{-3}
4. $\frac{x^{-2}}{y^{-3}}$
5. $3^4\ 5^{-2}$
6. $\frac{x^6\ z^7}{y^{-3}}$
7. 9^0
8. $\frac{5^{-4}}{7^{-8}}$

B. Write each number below in expanded exponential notation.

OPTIONAL

1. 13.700 32
2. 30 040.03
3. 765.328

C. Simplify the following and leave your answer in exponential notation.

1. $5^2 \times 5^6$
2. $2^{10} \cdot 2^4$
3. $(-1)^8\ (-1)^5$
4. $7^5 \div 7^{-2}$
5. $4^{-2} \cdot 4^5$
6. $(\frac{2}{3})^3\ (\frac{2}{3})^{-3}$
7. $4^5 \div 4^{-9}$
8. $(\frac{1}{4})^{-7} \div (\frac{1}{4})^{-3}$
9. $(-1)^{14} \cdot (-1)^{21}$
10. $x^2\ x^3\ x^4\ x^5$
11. $3^2\ x^2\ 3^5\ x^3$
12. $5\ x^2 \cdot 5^2 \cdot x^3$
13. $(x^2\ y^3)^5$
14. $(-3)^2$
15. $(2\ x^3\ y)^7$
16. $25^8 \div 25^{-8}$
17. $25^{-8} \div 25^8$
18. $3^{-4} \div 3^{-3}$
19. $x^3\ y^2\ x^7\ y^6\ x$
20. $7^2\ 7^3\ 7^{-5}\ 7^8$
21. $(x^4\ y^3)^4$
22. $x^2\ (x^4)^5$
23. $4^2 \cdot 4^6 \cdot (4^4)^7$
24. $(5\ x^2\ y\ z^5)^2$

D. Express each as a single power.

1. $7^5 \div 7^3$
2. $4^3 \times 4^6 \div 4^8$
3. $x^2 \cdot x^6 \div x^8$
4. $x^6 \div x^4 \cdot x^3$
5. $5^{-3} \cdot 5^{-4} \div 5^{-7}$
6. $6^{-4} \div 6^{-4} \div 6^{-4}$
7. $8^3 \cdot 8^3 \cdot 8^8$
8. $x \cdot x^2 \cdot x^3$
9. $15^3 \div 15^{-8} \div 15^4$
10. $2^{16} \div 2^{14} \times 2^{13}$
11. $z^6 \cdot z^3 \cdot z^{-3}$
12. $r^2 \cdot r^5 \div r^7$

E. Write each in standard form.

1. $7^2 + 5^2$
2. $2^4 \times 2^{-3}$
3. $(0.4)^5 \cdot (0.4)^{-3}$
4. $5^4 \div 25^{-1}$
5. $2^8 \div 4^4$
6. $625^{-1} \times 5^3$
7. $(^3/_7)^2$
8. $(^3/_2)^2 \cdot (^4/_4)^2$
9. 10^{-2}
10. $(-3)^3$
11. -5^4
12. $(^5/_2)^2 \times (^1/_4)^1$
13. $(2\ ½)^3$
14. $(0.03)^{-2}$
15. 7^0
16. $4^{-3} \cdot 4^5 \cdot 4^1 \cdot 4^{-2}$
17. $5^0 + 5^1 + 5^{-1}$
18. $4^{-1} - 4^{-2}$

F. Write each in scientific notation.

1. 93 000 000
2. 0.000 05
3. 70 000 000 000
4. 0.000 037 6
5. 25.000 3
6. 0.00035
7. 27 000 000
8. 36 000 000

G. Use a less than sign (<), a greater than sign (>) or an equal sign between each.

1. 2^{-3} ____ 3^{-2}
2. 5^2 ____ 5^{-2}
3. $(-7)^2$ ____ 7^{-2}
4. 3^{-5} ____ 5^{-3}
5. 10^5 ____ 10^3
6. 3^{-4} ____ 4^{-3}
7. 3^0 ____ 0^3
8. $(-7)^1$ ____ $(-7)^{-1}$
9. 2^5 ____ 3^4
10. 5^{-3} ____ 6^{-2}

H. Write each of the following in standard form.

1. $[5 \times 10^5] + [6 \times 10^4] + [3 \times 10^1] + [5 \times 10^{-1}]$
2. $[7 \times 10^{-1}] + [6 \times 10^{-3}] + [5 \times 10^{-4}]$
3. $^1/_5 - 5^{-1}$
4. $4^{-2} - 4^{-1}$
5. $(3)^2 \cdot (4)^3 \cdot (50)^1$
6. $8^3 + 7^3 + 6^3 + 5^3 + 4^3 + 3^3 + 2^3 + 1^3$
7. $3^2 \cdot 3^2 + 2^3 \cdot 2^3$