Appendix B.1

7. A. $yy^2y^8 = y^{11}$ B. $(y+1)(y+1)^2(y+1)^8 = (y+1)^{11}$

C. $[(y+1)(y+1)^8]^2 = [(y+1)^9]^2 = (y+1)^{18}$

10. A. $(y^2y^3)^2 = (y^5)^2 = y^{10}$ B. $y^2(y^3)^2 = y^2y^6 = y^8$

C. $2^m(2^n)^2 = 2^m 2^{2n} = 2^{m+2n}$

13. A $\frac{x^6y^{15}}{x^2y^{20}} = x^4y^{-5}$ OR $\frac{x^4}{y^5}$

B. $\frac{x^2y^{20}}{x^6y^{15}} = x^{-4}y^5$ OR $\frac{y^5}{x^4}$

14. A. $(x^2y^3z)^4 = x^8y^{12}z^4$

B. $2(x^2y^3z)^4 = 2x^8y^{12}z^4$

C. $(2x^2y^3z)^4 = 2^4x^8y^{12}z^4 = 16x^8y^{12}z^4$

15. A. $4(x^3)^2 = 4x^6$

B. $(4x^3)^2 = 16x^6$

C. $\frac{(4x^2)^3}{(4x^3)^2} = \frac{64x^6}{16x^6} = 4$

16. A. $2(x-1)^7 - (x-1)^7 = (x-1)^7[2-1] = (x-1)^7$

B. $[2(x-1)]^7 - (x-1)^7 = 128(x-1)^7 - (x-1)^7 = (x-1)^7(128-1)$
$= 127(x-1)^7$

C. $2(x-1)^7 - [2(x-1)]^7 = 2(x-1)^7 - 128(x-1)^7 = -126(x-1)^7$

20. A. $4^{-2} + 4^{-1} = \frac{1}{16} + \frac{1}{4} = \frac{5}{16}$

B. $[(\frac{1}{4})^{-1} + (\frac{1}{4})^{-2}]^{-1} = (4+16)^{-1} = 20^{-1} = \frac{1}{20}$

C. $[(\frac{1}{4})^{-1}(\frac{1}{4})^{-2}]^{-1} = [(4)(16)]^{-1} = \frac{1}{64}$

22. $\left(\frac{1}{3}+\frac{1}{4}\right)^{-1} = \left(\frac{4}{12}+\frac{3}{12}\right)^{-1} = \left(\frac{7}{12}\right)^{-1} = \frac{12}{7}$

26. $(a^3b)^3(a^2b^4)^{-1} = a^9b^3a^{-2}b^{-4} = a^7b^{-1} = \frac{a^7}{b}$

28. $\left(2^{-2}+2^{-1}+2^0\right)^{-2} = \left(\frac{1}{4}+\frac{1}{2}+1\right)^{-2} = \left(\frac{1}{4}+\frac{2}{4}+\frac{4}{4}\right)^{-2} = \left(\frac{7}{4}\right)^{-2} = \frac{16}{49}$

30. $\left(\frac{x^4y^{-8}z^2}{xy^2z^{-6}}\right)^2 = \left(x^3y^{-10}z^{-8}\right)^2 = x^3y^{-20}z^{-16} = \frac{x^3}{y^{20}z^{16}}$

32. $\left(\frac{a^3b^{-9}c^2}{a^5b^2c^{-4}}\right)^0 = 1$

34. $(2x^2)^{-3} - 2(x^2)^{-3} = 2^{-3}(x^2)^{-3} - 2(x^2)^{-3}$

$= x^{-6}\left(\frac{1}{8}-2\right) = -\frac{15}{8}x^{-6}$

36. $\frac{b^{p+2q}}{(b^2)^q} = \frac{b^{p+2q}}{b^{2q}} = b^{p+2q-2q} = b^p$

38. $\left(2^{p-q}\right)\left(2^{q-p+1}\right) = 2^{p-q+q-p+1} = 2^1 = 2$

40 $\frac{2^{12}5^{13}}{10^{12}} = \frac{2^{12}5^{13}}{(2\cdot5)^{12}} = \frac{2^{12}5^{13}}{2^{12}5^{12}} = 5$

42. $\left(\frac{144\cdot125}{2^3\cdot3^2}\right)^{-1} = \left(\frac{12^2\,5^3}{2^3\cdot3^2}\right)^{-1}\left(\frac{3^2\,2^4\,5^3}{2^3\,3^2}\right)^{-1}(125\cdot2)^{-1} = \frac{1}{250}$

50. A 1.67×10^{-24}

B. 9.11×10^{-28}