

Ch. 15 MC Review Solutions

5.
$$[\text{OH}^-] = 7.5 \times 10^{-3} \text{ M Ca(OH)}_2 \times \frac{2 \text{ mol OH}^-}{1 \text{ mol Ca(OH)}_2} = 1.5 \times 10^{-2} \text{ M}$$

6.
$$[\text{H}^+] = 0.084 \times 0.10 \text{ M} = 8.4 \times 10^{-3} \text{ M}$$

7.
$$[\text{OH}^-] = 0.013 \times 0.10 \text{ M} = 1.3 \times 10^{-3} \text{ M}; [\text{H}^+] = \frac{1.0 \times 10^{-14}}{1.3 \times 10^{-3}} = 7.7 \times 10^{-12} \text{ M}$$

8.
$$[\text{H}^+] = 0.000070 \times 0.10 \text{ M} = 7.0 \times 10^{-6} \text{ M}; \text{pH} = -\log(7.0 \times 10^{-6}) = 5.15$$

9.
$$[\text{OH}^-] = 1.6 \text{ M}; [\text{H}^+] = \frac{1.0 \times 10^{-14}}{1.6} = 6.25 \times 10^{-15} \text{ M}; \text{pH} = -\log(6.25 \times 10^{-15}) = 14.20$$

10.
$$[\text{H}^+]_{\text{cola}} = 1.0 \times 10^{-3} \text{ M}; [\text{H}^+]_{\text{milk}} = 1.0 \times 10^{-7} \text{ M}; \frac{[\text{H}^+]_{\text{cola}}}{[\text{H}^+]_{\text{milk}}} = \frac{1.0 \times 10^{-3}}{1.0 \times 10^{-7}} = 10,000$$

11.
$$[\text{H}^+] = \frac{M_1 V_1 + M_2 V_2}{V_1 + V_2} = \frac{(1.0 \times 10^{-2} \text{ M})(10.0 \text{ mL}) + (1.0 \times 10^{-6} \text{ M})(10.0 \text{ mL})}{(10.0 \text{ mL} + 10.0 \text{ mL})} = 5.0005 \times 10^{-3} \text{ M};$$

$$\text{pH} = -\log(5.0005 \times 10^{-3}) = 2.30$$