pH, pOH, $K_a$ & $pK_a$ worksheet

Calculate the pH of each of the following aqueous solutions and tell whether the solution is acidic, basic or neutral.

1. $[H^+] = 4.59 \times 10^{-7} \ M$
2. $[OH^-] = 7.42 \times 10^{-5} \ M$

Calculate the pOH of each of the following aqueous solutions:

3. $[OH^-] = 4.59 \times 10^{-13} \ M$
4. $[H^+] = 4.29 \times 10^{-11} \ M$

Calculate $[H^+]$ in each of the following aqueous solutions:

5. pH = 13.1
6. pOH = 4.95

Calculate $[OH^-]$ in each of the following aqueous solutions:

7. pOH = 9.39
8. pH = 2.54
9. An 0.100 \( M \) solution of nitrous acid (HNO\(_2\)) has a pH of 2.17.

(a) What is \([H^+]\) for this solution?

(b) What is \([NO_2^-]\) for this solution?

(c) What is \([HNO_2]\) for this solution? (Hint: it is close to, but not exactly 0.1 \( M \). The concentration of 0.1 \( M \) does not account for dissociation.)

(d) What is the value of \( K_a \) for HNO\(_2\)?

(e) What is the \( pK_a \) of HNO\(_2\)?