Determining the pH of Buffer Solutions Answer Key

1. $[HNO_2] = 0.25$ mol/L; $[NO_2^-] = 0.25$ mol/L

2. $HNO_2(s) + H_2O(\ell) \leftrightarrow H_3O^+(aq) + NO_2^-(aq)$

3.

Equation: $HNO_2(s) + H_2O(\ell) \leftrightarrow H_3O^+(aq) + NO_2^-(aq)$

	$[HNO_2(s)]$ (mol/L)	$[H_2O(\ell)]$ (mol/L)	$[H_3O^+(aq)]$ (mol/L)	$[NO_2^-(aq)]$ (mol/L)
Initial	0.25			0.25
Change	$-x$		x	$+x$
Equilibrium	$0.25 - x$		x	$0.25 + x$

4. $K_a = \dfrac{[H_3O^+][NO_2^-]}{[HNO_2]}$

5. $x = 5.6 \times 10^{-4}$

6. pH = 3.25