How many significant figures in the answer?

$\log(7.31\underline{0} \times 10^{23}) =$

1. 23.
2. 23.9
3. 23.86
4. 23.8639

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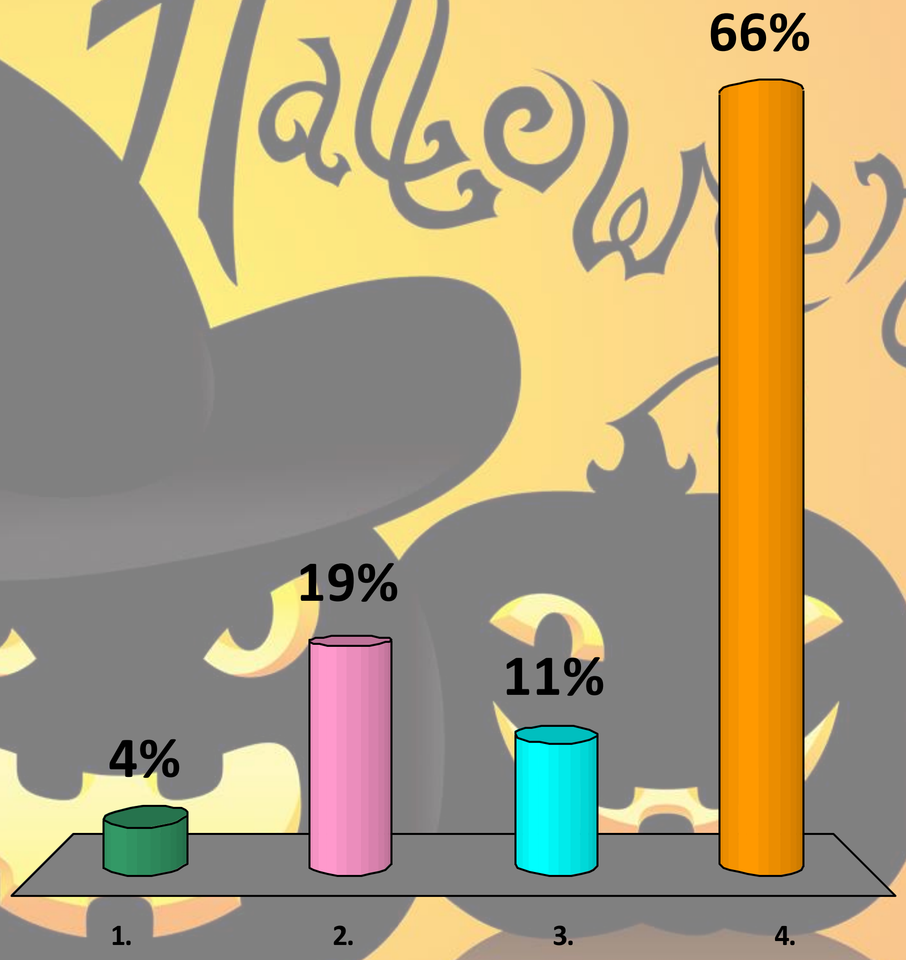

For: NH_3 (aq) + H_2O (l) $\leftrightarrows$ NH_4^+ (aq) + OH^- (aq)

Fill in the chart below:

1.

	NH_3 (aq)	NH_4^+ (aq)	+ OH^- (aq)
initial molarity	0.15	0	0
change in molarity	**+x**	**+x**	**+x**
equilibrium molarity	**0.15+x**	**+x**	**+x**

2.

initial molarity	0.15	0	0
change in molarity	0	**+x**	**+x**
equilibrium molarity	**0.15**	**+x**	**+x**

3.

initial molarity	0.15	0	0
change in molarity	**-x**	**+x**	**+x**
equilibrium molarity	**0.15-x**	**+x**	**+x**

For: NH_3 (aq) + H_2O (l) $\leftrightarrows$ NH_4^+ (aq) + OH^- (aq)

Fill in the chart below:

1. (3%)

	NH_3 (aq)	NH_4^+ (aq)	+ OH^- (aq)
initial molarity	0.15	0	0
change in molarity	**+x**	**+x**	**+x**
equilibrium molarity	**0.15+x**	**+x**	**+x**

2. (3%)

	NH_3 (aq)	NH_4^+ (aq)	+ OH^- (aq)
initial molarity	0.15	0	0
change in molarity	0	**+x**	**+x**
equilibrium molarity	**0.15**	**+x**	**+x**

3. (95%)

	NH_3 (aq)	NH_4^+ (aq)	+ OH^- (aq)
initial molarity	0.15	0	0
change in molarity	**-x**	**+x**	**+x**
equilibrium molarity	**0.15-x**	**+x**	**+x**

When asked to "check assumption," what do you do?

1. 0.00164/0.15 x 100 % = 1.1 % (1.1% is less then 5%, assumption is okay)
2. 0.15 - 0.00164 = 0.14836 (within sig figs, 0.00164 is small compared to 0.15)
3. 0.00164 x 0.15 x 100 % = 0.0246 % (0.0246 % is less then 5%, assumption is okay)
4. (0.15 – 0.00164) x 100 % = 14.8 % (14.8 is greater than 5%, assumption is not okay)

When asked to "check assumption," what do you do?

81% 1. 0.00164/0.15 x 100 % = 1.1 % (1.1% is less then 5%, assumption is okay)

3% 2. 0.15 - 0.00164 = 0.14836 (within sig figs, 0.00164 is small compared to 0.15)

7% 3. 0.00164 x 0.15 x 100 % = 0.0246 % (0.0246 % is less then 5%, assumption is okay)

9% 4. (0.15 – 0.00164) x 100 % = 14.8 % (14.8 is greater than 5%, assumption is not okay)

Predict whether the pH is acidic, neutral, or basic for a solution of **$NaCH_3COO(aq)$**.

K_a of CH_3COOH is 1.76×10^{-5}.

1. acidic
2. neutral
3. Basic
4. Not enough information

Predict whether the pH is acidic, neutral, or basic for a solution of **$NaCH_3COO(aq)$**.

K_a of CH_3COOH is 1.76×10^{-5}.

14% 1. acidic

9% 2. neutral

72% 3. Basic

6% 4. Not enough information

A strong acid and the salt of its conjugate base don’t make a good buffer. Why?

1. The conjugate base of a strong acid is a **weak** base, and a weak base can’t neutralize added acid so pH is not maintained.
2. The conjugate base of a strong acid is **ineffective** as a base, and an ineffective base can’t neutralize added acid so pH is not maintained.
3. The conjugate base of a strong acid is a **strong** base, and a strong base changes the pH.

A strong acid and the salt of its conjugate base don't make a good buffer. Why?

21% 1. The conjugate base of a strong acid is a **weak** base, and a weak base can't neutralize added acid so pH is not maintained.

67% 2. The conjugate base of a strong acid is **ineffective** as a base, and an ineffective base can't neutralize added acid so pH is not maintained.

13% 3. The conjugate base of a strong acid is a **strong** base, and a strong base changes the pH.

Which is the correct simplified expression for K_a following application of the assumption that x is small compared to 1.00 and 0.500?

1. $K_a = 0.500/1.00$
2. $K_a = (x)(0.500+x)/1.00$
3. $K_a = x^2/1.00$
4. $K_a = (x)(0.500)/1.00$
5. $K_a = (x)(0.500)/1.00-x$
6. $K_a = x\,/1.00$

Which is the correct simplified expression for K_a following application of the assumption that x is small compared to 1.00 and 0.500?

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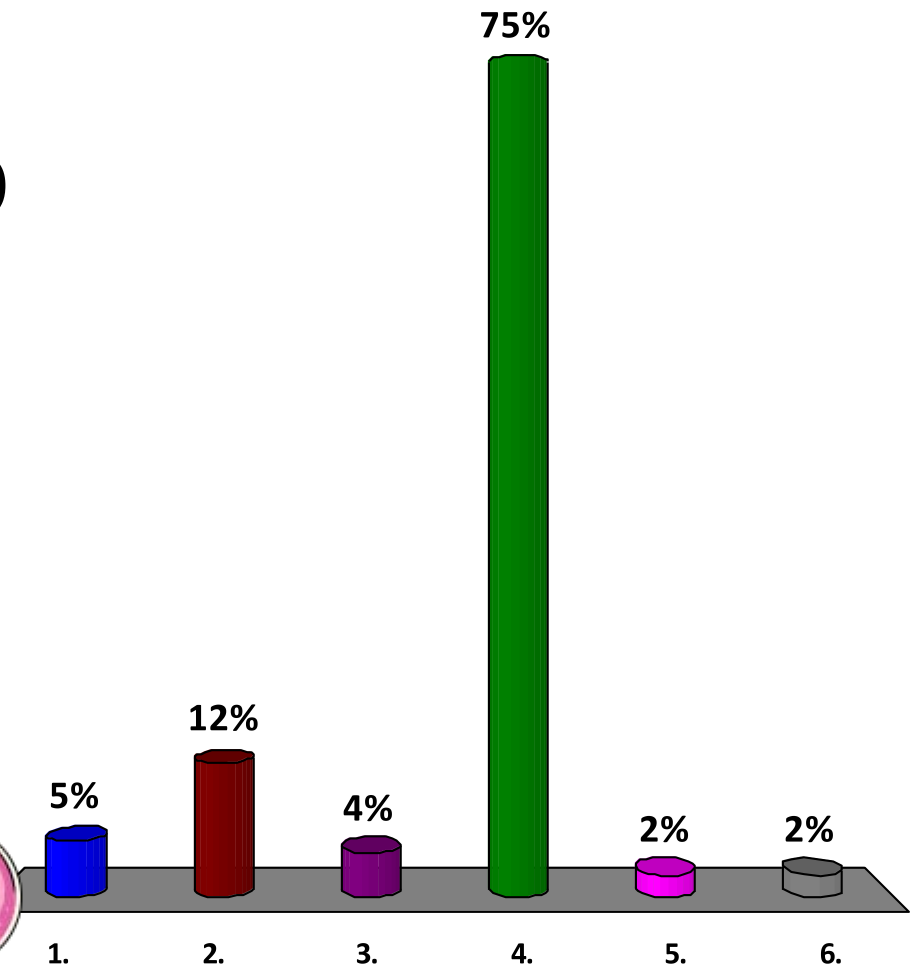
6. $K_a = x\ /1.00$



Which of the following K_a expressions is correct following the addition of 0.100 mol of HCl?

0%

1. $K_a = [H_3O^+][HCOO^-]/[HCOOH]$
   $K_a = (0.400 + x)(x) / (1.10 - x)$

0%

2. $K_a = [H_3O^+][HCOO^-]/[HCOOH][H_2O]$
   $K_a = (0.400 + x)(x) / (1.10 - x)$

0%

3. $K_a = [H_3O^+][HCOO^-]/[HCOOH]$
   $K_a = x^2 / (1.10 - x)$

0%

4. $K_a = [H_3O^+][HCOO^-]/[HCOOH]$
   $K_a = (0.500 + x)(x) / (1.00 - x)$

10

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   $K_a = x^2 / (1.10 - x)$

0%

4. $K_a = [H_3O^+][HCOO^-]/[HCOOH]$
   $K_a = (0.500 + x)(x) / (1.00 - x)$

10