Simplify the following radicals.

1. $\pm \sqrt{25}$
2. $3\sqrt{81}$
3. $\sqrt{50}$
4. $2\sqrt{18}$
5. $\sqrt{48}$
6. $\sqrt{32}$
7. $3\sqrt{36}$
8. $2\sqrt{56}$
9. $4\sqrt{98}$
10. $\sqrt{240}$
11. $-2\sqrt{108}$

Solve the following equations using the quadratic formula.

12. Solve $x^2 - 3x - 7 = 0$. Round your solutions to the nearest hundredth.

13. Solve $2x^2 - 8x = 10$. Leave your answers in simplest radical form if necessary.
14. Solve $x^2 + 8x - 5 = 0$. Leave your roots in simplest radical form if necessary.

\[
x = -\frac{b \pm \sqrt{b^2 - 4ac}}{2a}
\]

\[
x = -\frac{8 \pm \sqrt{8^2 - 4(1)(-5)}}{2(1)} = -\frac{8 \pm \sqrt{84}}{2}
\]

\[
x = -\frac{8 \pm 2\sqrt{21}}{2} = -4 \pm \sqrt{21}
\]

15. Solve $10 - 3x^2 - 14x = 0$. Leave your zeros in simplest radical form if necessary.

16. Jacob wants to create a rectangular flower garden that contains an area of $10 \text{ m}^2$. If the length needs to be 2 meters longer than the width, determine the dimensions of the garden, to the nearest hundredth of a meter.

Let $w = \text{width}$

\[
\begin{align*}
A &= L \cdot W \\
10 &= w(w + 2) \\
10 &= w^2 + 2w
\end{align*}
\]

\[
0 = w^2 + 2w - 10
\]

\[
w = \frac{-2 \pm \sqrt{2^2 - 4(1)(-10)}}{2(1)} = \frac{-2 \pm \sqrt{44}}{2}
\]

\[
w = \frac{-2 \pm \sqrt{44}}{2}
\]

\[
w = -2 \pm \sqrt{11}
\]

\[
w = -2 \pm 3.317
\]

\[
w = -2 + 3.317 = 1.3
\]

\[
w = -2 - 3.317 = -5.3
\]

Let $w = \text{width}$

\[
\begin{align*}
A &= L \cdot W \\
10 &= w(w + 2) \\
10 &= w^2 + 2w
\end{align*}
\]

\[
0 = w^2 + 2w - 10
\]

\[
w = \frac{-2 \pm \sqrt{2^2 - 4(1)(-10)}}{2(1)} = \frac{-2 \pm \sqrt{44}}{2}
\]

\[
w = \frac{-2 \pm \sqrt{44}}{2}
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\[
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\]

\[
w = -2 \pm 3.317
\]

\[
w = -2 + 3.317 = 1.3
\]

\[
w = -2 - 3.317 = -5.3
\]
Regents Review: Completing the Square

Solve the following equations by completing the square.

(1) \( x^2 - 8x + 16 = 0 \)
\[
(x - 4)^2 = 0
\]
\[
(x - 4) = \pm \sqrt{0}
\]
\[
x = 4
\]

(2) \( x^2 - 14x = 0 \)
\[
\sqrt{5} - 4 = -2...
\]
\[
\sqrt{5} + 4 = 6....
\]
\[
1 + 2 = 3
\]
\[
+4
\]
\[
-4
\]

(3) \( 0 = x^2 + 4x + 3 \)
\[
x = \pm \sqrt{5} + 4
\]

(4) \( 0 = -x^2 - 16x - 7 \)
\[
0 = -1(x^2 + 16x + 64) - 7
\]
\[
0 = -1(x + 8)^2 + 57
\]

(5) \( 2 = -x^2 + 6x \)

(6) \( 9 = 3x^2 - 30x \)
(7) \[ 16x = 4x^2 + 8 \]  
(8) \[ -5x^2 = 10x + 1 \]

(9) Which equation has the same solutions as \[ x^2 + 6x - 7 = 0 \]

(1) \( (x + 3)^2 = 2 \)  
(2) \( (x - 3)^2 = 2 \)  
(3) \( (x - 3)^2 = 16 \)  
(4) \( (x + 3)^2 = 16 \)