Question 1:
Which of the following represents the complex solution(s) to the quadratic equation, $0 = 2x^2 + 4$?

A. $x = -\sqrt{2}$

Incorrect. This does not represent a complex number. This is simply a negative irrational number.

B. $x = \sqrt{-2i}$
Incorrect. The number i will not appear inside a radical.

C. $x = i\sqrt{2}$
Correct! $2x^2 = -4, so\ x^2 = -2,\ then\ \sqrt{x^2} = \sqrt{-2}$

D. $x = 2i$ or $-\ 2i$
Incorrect. These are solutions to $y = x^2 + 4$

Question 2:
The quadratic equation $y = x^2 - 2x + 6$ has no real solutions. Which of the following are correct solution(s) to this equation?

A. $1 + 2i\sqrt{5}\ \ and\ 1 - 2i\sqrt{5}$

Incorrect. Mistake in simplifying

$$\frac{2\pm\sqrt{2^2-4(1)(6)}}{2(1)} = \frac{2\pm\sqrt{4-24}}{2} = \frac{2\pm\sqrt{-20}}{2} = \frac{2\pm\sqrt{-1*4*5}}{2} = \frac{2\pm 2i\sqrt{5}}{2}$$

.

B. $1 + i\sqrt{20}\ and\ 1 - i\sqrt{20}$

Incorrect. Simplification mistake.

$$\frac{2\pm\sqrt{2^2-4(1)(6)}}{2(1)} = \frac{2\pm\sqrt{4-24}}{2} = \frac{2\pm\sqrt{-20}}{2} = \frac{2\pm\sqrt{-1*4*5}}{2} = \frac{2\pm 2i\sqrt{5}}{2}$$

C. $\frac{2+i\sqrt{5}}{2}\ and\ \frac{2-i\sqrt{5}}{2}$

Incorrect. Missing a factor in the numerator.

$$\frac{2\pm\sqrt{2^2-4(1)(6)}}{2(1)} = \frac{2\pm\sqrt{4-24}}{2} = \frac{2\pm\sqrt{-20}}{2} = \frac{2\pm\sqrt{-1*4*5}}{2} = \frac{2\pm 2i\sqrt{5}}{2}$$

D. $1 + i\sqrt{5}\ and\ 1 - i\sqrt{5}$ Correct! $\frac{2\pm 2i\sqrt{5}}{2} = \frac{2}{2} \pm \frac{2i\sqrt{5}}{2} = 1 \pm i\sqrt{5}$

Question 3:

The solutions to the equation $y = x^2 + 6x + 11$ are

A. $x = -3 \pm 2i\sqrt{2}$

Incorrect. The *2* in *2i* divides out when simplified.

B. $x = -3 \pm i\sqrt{2}$

Correct! $\frac{-6\pm\sqrt{36-44}}{2} = \frac{-6\pm\sqrt{-8}}{2} = \frac{-6\pm\sqrt{-1\cdot 4\cdot 2}}{2} = \frac{-6\pm 2i\sqrt{2}}{2} = \frac{-6}{2} \pm \frac{2i\sqrt{2}}{2} = -3 \pm i\sqrt{2}$

C. $x = -6 \pm i\sqrt{11}$

Incorrect. Incorrect number under the radical in the quadratic formula $b^2 - 4ac$

D. $x = -6 \pm 2i\sqrt{11}$

Incorrect. Incorrect number under the radical in the quadratic formula $b^2 - 4ac$

Question 4:

The complex conjugates $2 \pm 3i\sqrt{7}$ could be complex solutions to which of the following equations?

A. $x^2 - 4x - 59 = 0$ Incorrect. This one will have real solutions.

B. $x^2 - 4x + 67 = 0$ Correct! $b^2 - 4ac = 16 - 268 = -252$

C. $x^2 - 4x - 63 = 0$ Incorrect. This one will have real solutions.

D. $x^2 + 4x + 59 = 0$ Incorrect. $b^2 - 4ac = 16 - 236 = -220$