Math 154B Name_____

Completing the Square Worksheet

To solve $ax^2 + bx + c = 0$ by "**completing the square**":

1) Put the variable terms are on the left of the equal sign, in standard form, and the constant term is on the right. So, get it into the form $ax^2 + bx = c$.
2) Divide by " a ", so the coefficient of x^2 is 1.
3) Take one-half the coefficient of the x-term, squaring it, and adding this quantity to both sides of the equation. Basically, add $\left(\frac{b}{2}\right)^2$ to both sides.
4) Factor the Perfect Square Trinomial on the left side of the equation and simplify the right side. Remember, it always factors into $\left(x + \frac{b}{2}\right)^2$
5) Use the principle of square roots
6) Solve the remaining equation
7) Check your answer in the original equation.

Solve each equation by completing the square.

1. $x^2 - 2x - 15 = 0$

2. $x^2 + 2x = 35$

3. $2x^2 + 8x - 7 = -2$

4. $8x = 4x^2 - 1$

5. $2x^2 - 4x + 5 = 6$

6. $6x = 4x^2 - 1$

7. $x^2 + 2x - 8 = 0$

8. $x^2 - 7x = 18$

9. $3x^2 - 2x - 2 = 4$

10. $-7x = 3x^2 - 1$

11. $x^2 - 2x - 1 = 2$

12. $x^2 + 3x = 40$

13. $x^2 + 4x = 3$

14. $7x = 4x^2 - 1$

Answers:

1. $x = -3, x = 5$
2. $x = -7, x = 5$
3. $x = \frac{-4+\sqrt{26}}{2}, x = \frac{-4-\sqrt{26}}{2}$
4. $x = \frac{2+\sqrt{5}}{2}, x = \frac{2-\sqrt{5}}{2}$
5. $x = \frac{2+\sqrt{6}}{2}, x = \frac{2-\sqrt{6}}{2}$
6. $x = \frac{3+\sqrt{13}}{4}, x = \frac{3-\sqrt{13}}{4}$
7. $x = -4, x = 2$
8. $x = -2, x = 9$
9. $x = \frac{1+\sqrt{19}}{3}, x = \frac{1-\sqrt{19}}{3}$
10. $x = \frac{-7+\sqrt{61}}{6}, x = \frac{-7-\sqrt{61}}{6}$
11. $x = -1, x = 3$
12. $x = -8, x = 5$
13. $x = -2+\sqrt{7}, x = -2-\sqrt{7}$
14. $x = \frac{7+\sqrt{65}}{8}, x = \frac{7-\sqrt{65}}{8}$