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False. The discriminant is b^2 - $4ac = 4^2$ - 4(1)(4) = 16 - 16 = 0, which means the equation has one real repeated root (x = -2).







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True. A negative discriminant indicates that the quadratic equation has two complex conjugate roots, but no real solutions.







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True. Using the vertex formula x = -b/(2a) = 8/(4)

= 2, then $y = 2(2)^2 - 8(2) + 6 = 8 - 16 + 6 = -2$.







The quadratic equation (x-3)(x+2)

= 0 has roots x = 3 and x = -2.





The quadratic equation (x-3)(x+2) = 0 has roots x = 3 and x = -2.

True. Using the zero product property, if (x-3)(x+2)= 0, then either x-3 = 0 or x+2 = 0, giving roots x = 3 and x = -2.







The sum of the roots of the quadratic equation $ax^2 + bx + c$ = 0 is equal to b/a.





The sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to b/a.

False. The sum of the roots is -b/a, not b/a. For a quadratic equation $ax^2 + bx + c = 0$, if the roots are r_1 and r_2 , then $r_1 + r_2 = -b/a$.







The quadratic equation $x^2 - 5x + 6$

6 = 0 can be factored as (x-2)(x-3)





The quadratic equation $x^2 - 5x + 6 = 0$ can be factored as (x-2)(x-3) = 0.

True. The factors multiply to give x^2 - 5x + 6, and when set equal to zero, give the correct roots x = 2 and x = 3.







The axis of symmetry of the parabola $y = x^2 + 6x + 8$ is x = -3.





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True. The axis of symmetry for a parabola in the form $y = ax^2 + bx + c$ is x = -b/(2a) = -6/(2) = -3.







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False. If the discriminant is negative, the parabola does not intersect the x-axis at all. A positive leading coefficient means it opens upward, but it will be entirely above the x-axis.







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True. The quadratic formula $x = [-b \pm \sqrt{(b^2-4ac)}]/(2a)$ provides solutions for any quadratic equation $ax^2 + bx + c = 0$.







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True. For a quadratic equation $ax^2 + bx + c = 0$, the product of the roots is c/a = 3/2.







The quadratic equation $x^2 + 1 = 0$ has no real solutions.





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True. Solving $x^2 + 1 = 0$ gives $x^2 = -1$, which has no real solutions since the square of a real number cannot be negative.







Completing the square for $x^2 + 8x + 15$ gives $(x+4)^2 - 1$.





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True.
$$x^2 + 8x + 15 = (x^2 + 8x + 16) - 16 + 15 = (x+4)^2 - 1$$
.







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If the vertex of a parabola is at (2,5) and it opens downward, then the maximum value of the quadratic function is 5.

True. For a downward-opening parabola, the vertex represents the maximum point, so the maximum value is the y-coordinate of the vertex, which is 5.







The quadratic equation $3x^2 - 12x + 12 = 0$ has two distinct real roots.





The quadratic equation $3x^2 - 12x + 12 = 0$ has two distinct real roots.

False. The discriminant is $(-12)^2 - 4(3)(12) = 144 - 144 = 0$, so it has one real repeated root (x = 2).







The graph of $y = -2x^2 + 4x - 1$ opens downward.





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True. The coefficient of x^2 is -2, which is negative, so the parabola opens downward.







The quadratic equation $x^2 - 9 = 0$ can be solved by taking the square root of both sides, giving x = 3





The quadratic equation $x^2 - 9 = 0$ can be solved by taking the square root of both sides, giving x = 3.

False. Taking square roots gives $x = \pm 3$, not just x = 3. The equation has two solutions: x = 3 and x = -3.







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True. Using the sum and product of roots: sum = 4 + (-2) = 2, product = $4 \times (-2) = -8$, so the equation is x^2 - (sum)x + product = x^2 - 2x - 8 = 0.







The minimum value of the quadratic function $y = x^2 - 6x + 10$ occurs at x = 3.





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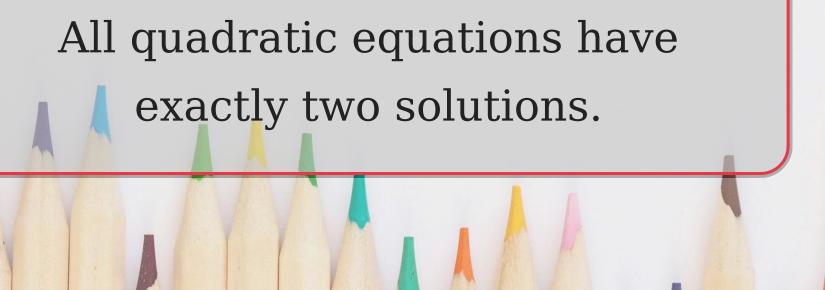
True. The vertex occurs at x = -b/(2a) = 6/(2) = 3, and since the coefficient of x^2 is positive, this represents the minimum point.







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All quadratic equations have exactly two solutions.

False. While quadratic equations are degree 2 polynomials, they can have two distinct real roots, one repeated real root, or two complex roots. The number of real solutions can be 0, 1, or 2.







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True. Using the quadratic formula with a=2, b=5, c=-3: $x = [-5 \pm \sqrt{(5^2 - 4(2)(-3))}]/(2 \times 2) = [-5 \pm \sqrt{(25 + 24)}]/4$.