

Algebra I Pre-AP -- The Discriminant and the Quadratic Formula
Work all problems on notebook paper using a pencil.

For #1 - 6, find the value of the discriminant and the number and nature of the solutions.

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|------------------------|-----------------------|-------------------------|
| 1) $2x^2 + 4x + 3 = 0$ | 2) $x^2 + 4x + 4 = 0$ | 3) $2x^2 - 11x + 6 = 0$ |
| 4) $x^2 + x + 1 = 0$ | 5) $3x^2 = 5x - 1$ | 6) $-2x + 3 = 2x^2$ |

Solve #7 - 12 by using the quadratic formula. Be sure to simplify each answer as we did in class.

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|------------------------|------------------------|---------------------|
| 7) $x^2 + 6x + 3 = 0$ | 8) $x^2 - 7x + 2 = 0$ | 9) $3x^2 = -x + 5$ |
| 10) $x^2 - 4x - 7 = 0$ | 11) $2x^2 + x - 7 = 0$ | 12) $9 = 2x^2 + 3x$ |

Algebra I Pre-AP
Choosing the Best Method for Solving Quadratic Equations

In each group of 4 equations below, one is best solved by taking the square root of each side, one is best solved by factoring, one is easily solved by completing the square, and the quadratic formula is the best method for the last one. Choose the best method for each equation, then solve. Express all answers involving radicals in simplest radical form.

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| 1a) $a^2 - 8a + 6 = 0$ \square $a = 4 \pm \sqrt{10}$ | b) $3b^2 = 5b + 10$ QUAD $b = \frac{5 \pm \sqrt{145}}{6}$ |
| c) $c^2 - 5c = 36$ Factor $c = \{9, -4\}$ | d) $2d^2 - 120 = 0$ $\sqrt{\quad}$ $d = \pm 2\sqrt{15}$ |

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| 2a) $2a^2 = 27$ $\sqrt{\quad}$ $a = \frac{\pm 3\sqrt{6}}{2}$ | b) $3b^2 - 4 = 3b$ Quad $b = \frac{3 \pm \sqrt{57}}{6}$ |
| c) $c^2 + 8c = -10$ \square $x = -4 \pm \sqrt{6}$ | d) $0 = 4d^2 - 20d + 25$ Factor $d = 5/2$ |

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| 3a) $2a^2 = 11a - 5$ Factor $a = \{5/2, 5\}$ | b) $6b^2 - 5 = 4b^2 + 15$ $\sqrt{\quad}$ $b = \pm \sqrt{10}$ |
| c) $c^2 = 6c + 23$ \square $c = 3 \pm 4\sqrt{2}$ | d) $d^2 + 7d - 15 = 0$ Quad $d = \frac{-7 \pm \sqrt{109}}{2}$ |

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|---|--|
| 4a) $5 + 2a(2a+1) = 2(a+40)$ $\sqrt{\quad}$ $a = \frac{\pm 5\sqrt{2}}{2}$ | b) $b^2 + 10b + 5 = 0$ \square $b = -5 \pm 2\sqrt{5}$ |
| c) $6c^2 + 13c = 5$ Factor $c = -5/2, 1/3$ | d) $3d^2 + 6d = 1$ Quad $d = \frac{-6 \pm 4\sqrt{3}}{3}$ |

- ① $D = -8$
No Real Solutions or 2 Imaginary
- ② $D = 0$
1 Real Solution
- ③ $D = 73$
2 Real Solutions
- ④ $D = -3$
No Real Solutions

- ⑤ $D = 13$
2 Real Solutions
- ⑥ $D = 28$
2 Real Solutions
- ⑦ $x = -3 \pm \sqrt{6}$
 $\{-0.55, -5.45\}$
- ⑧ $x = \frac{7 \pm \sqrt{41}}{2}$
 $\{0.30, 6.70\}$

- ⑨ $\frac{-1 \pm \sqrt{61}}{6} = x$
 $\{1.14, -1.47\}$
- ⑩ $2 \pm \sqrt{11} = x$
 $\{5.32, -1.32\}$
- ⑪ $x = \frac{-1 \pm \sqrt{57}}{4}$
 $\{1.64, -2.14\}$
- ⑫ $x = 3/2, -3$