

Standard 4B Review: Solving Quadratics

Name: Key Hr: _____

Give three other names for solutions to quadratic equations: _____

Solve the following equations. Answers should be simplified and in exact form.

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1. $6x^2 + 42x = 0$
 $6x(x+7) = 0$
 $6x = 0 \quad x+7 = 0$

$X = 0 \text{ and } -7$

2. $9x^2 - 18x = 0$
 $9x(x-2) = 0$

$X = 0, X = 2$

3. $x^2 - 26x + 25 = 0$
 $(x^2 - 25x)(-x + 25) = 0$
 $x(x-25) - 1(x-25) = 0$
 $x-1 = 0 \quad x-25 = 0$

$X = 1 \text{ and } 25$

4. $x^2 - x - 30 = 0$
 $(x-6)(x+5) = 0$

$X = 6 \text{ and } -5$

5. $2x^2 - 5x = 3$
 $2x^2 - 5x - 3 = 0$

$(2x^2 - 6x) + (x - 3) = 0$
 $2x(x-3) + 1(x-3) = 0$
 $2x+1 = 0 \quad x-3 = 0$
 $X = -\frac{1}{2} \text{ and } 3$

6. $6x^2 + 11x = 10$
 $6x^2 + 11x - 10 = 0$

$X = \frac{2}{3} \text{ and } X = -\frac{5}{2}$

7. $\frac{3x^2}{3} = \frac{75}{3}$
 $x^2 = 25$

$X = \pm 5 \text{ or } X = 5 \text{ and } -5$

8. $2x^2 = 98$

$X = 7 \text{ and } -7$

9. $4x^2 + 3x = 9$ $a=4 \quad b=3 \quad c=-9$
 $4x^2 + 3x - 9 = 0$

$X = \frac{-3 \pm \sqrt{(3)^2 - 4(4)(-9)}}{2(4)}$

$\frac{3 \pm \sqrt{153}}{8} \quad \frac{-3 \pm 3\sqrt{17}}{8}$

10. $3x^2 + 6x = 2$
 $3x^2 + 6x - 2 = 0$
 $X = \frac{-6 \pm \sqrt{(6)^2 - 4(3)(-2)}}{2(3)}$

11. $(2x-3)^2 - 2 = 14$
 $(2x-3)^2 = 16$
 $2x-3 = \pm 4$
 $2x = \pm 4 + 3$
 $2x = -1 \text{ and } 7$
 $X = -\frac{1}{2} \text{ and } \frac{7}{2}$

12. $\frac{3(3x+1)^2}{3} = \frac{27}{3}$
 $(3x+1)^2 = 9$
 $3x+1 = +3 \text{ and } -3$
 $3x = 2 \text{ and } -4$
 $X = \frac{2}{3} \text{ and } -\frac{4}{3}$

$X = \frac{-6 \pm \sqrt{60}}{6} \quad X = \frac{-6 \pm 2\sqrt{15}}{6}$

$X = \frac{-3 \pm \sqrt{15}}{3} \text{ or } -1 \pm \frac{\sqrt{15}}{3} \quad X = -\frac{1}{2} \text{ and } \frac{7}{2}$

13. $(3x+5)(x-2) = 0$
 $3x+5 = 0 \quad x-2 = 0$
 $-5 \quad -5 \quad +2 \quad +2$
 $3x = -\frac{5}{3} \quad x = 2$
 $X = -\frac{5}{3} \text{ and } 2$

14. $(x-4)(2x-1) = 0$
 $x-4 = 0 \quad 2x-1 = 0$
 $X = 4 \text{ and } \frac{1}{2}$

15. $\frac{3 + \sqrt{72}}{9} \quad \frac{1}{3} + \frac{2\sqrt{2}}{3}$
 $\frac{1 + 2\sqrt{2}}{3} \text{ or } \frac{1}{3} + \frac{2\sqrt{2}}{3}$

Given the equations below find the discriminant and the number of x intercepts.

16. $y = 3x^2 + 6x - 4$
 $b^2 - 4ac = 84$
disc = 84

2 real solutions (x intercepts)

17. $y = -2x^2 - 5x - 7$
 $(-5)^2 - 4(-2)(-7) = 25 - 56 = -31$
disc = -31

no real solutions

18. $y = 3x^2 - 6x + 3$
 $(-6)^2 - 4(3)(3) = 36 - 36 = 0$
disc = 0

1 x intercept / solution