AC Math 1
Solving Quadratic Equations
By Factoring & Using Square Roots

Name Key

Solve each equation or find the zeros of the function by factoring or using square roots.

F
1. $6x^2 = 14x$

$6x^2 - 14x = 0$

$2x(3x-7) = 0$

$x = 0, 7/3$

2. $x^2 - 16 = 0$

R
3. $2(x+4)^2 - 10 = 0$

$+10 \quad +10$

$\frac{2}{2}(x+4)^2 = \frac{10}{2}$

$\sqrt{(x+4)^2} = \sqrt{5}$

$x+4 = \pm\sqrt{5}$

$x = -4 \pm \sqrt{5}$

4. $x^2 + 8x + 15 = 0$

R
5. $4(x-1)^2 - 100 = 0$

$\frac{4}{4}(x-1)^2 = \frac{100}{4}$

$\sqrt{(x-1)^2} = \sqrt{25}$

$x-1 = \pm 5$

$x = 1 \pm 5$

$x = 6, -4$

6. $9x(x-7) - 4(x-7) = 0$

F
7. $2x^2 = 5x + 3$

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

$(2x^2 - 6x) + (x - 3) = 0$

$2x(x-3) + 1(x-3) = 0$

$(2x+1)(x-3)$

$x = 3, -1/2$

8. $(x+6)^2 - 40 = 0$

R
9. $\frac{1}{4}(x+3)^2 - 1 = 0$

$\frac{1}{4}(x+3)^2 = 1$

$\sqrt{(x+3)^2} = \sqrt{4}$

$x + 3 = \pm 2$

$-3 \quad -3$

$x = -3 \pm 2$

$x = -1, -5$

10. $f(x) = \frac{2}{3}x^2 - 12$

F
11. $f(x) = 16x - 24$

$8(3x-4) = 0$

$3x - 4 = 0$

$x = 4/3$

12. $f(x) = 10x^2 + 25x - 60$

$5(2x^2 + 5x - 12)$

$5(2x^2 + 8x - 3x - 12) = 0$

$5[2x(x+4) - 3(x+4)] = 0$

$(2x-3)(x+4) = 0$

$-4 \quad 5$

$x = \frac{3}{2}, -4$

13. $f(x) = 4x^2 - 1$

$4x^2 - 1 = 0$

$\frac{4}{4}x^2 = \frac{1}{4}$

$\sqrt{x^2} = \sqrt{\frac{1}{4}}$

$x = \pm\frac{1}{2}$

14. $f(x) = 16x^2 - 9$

15. $f(x) = 5x(2x-1) + 3(2x-1)$

$(5x+3)(2x-1) = 0$

$x = -\frac{3}{5} \quad x = \frac{1}{2}$

16. $f(x) = 21x - 3x^2$

17. $f(x) = 4\left(x - \frac{7}{2}\right)^2 - 1$

$0 = 4(x-7/2)^2 - 1$

$+1 \quad +1$

$1 = 4(x-7/2)^2$

$\frac{1}{4} = \frac{4}{4}(x-7/2)^2$

$\sqrt{(x-\frac{7}{2})^2} = \sqrt{\frac{1}{4}}$

$x - \frac{7}{2} = \pm\frac{1}{2} + \frac{7}{2}$

$+7/2$

$x = \frac{8}{2} = 4$

$x = \frac{6}{2} = 3$

18. $f(x) = 5x^2 - 14x + 8$