

Solving Quadratic Equations
by Inspection

Name: Hirsch 2nd

Solve the following equations by Inspection:

Ex1. $4x^2 - 5 = -1$
 $\frac{+5}{+5} \frac{+5}{+5}$
 $\frac{4x^2}{4} = \frac{4}{4}$
 $\sqrt{x^2} = \sqrt{1} \quad x = \pm 1$

Ex2. $\frac{x^2}{6} - 4 = 10$
 $\frac{+4}{+4} \frac{+4}{+4}$
 $\frac{x^2}{6} = 14 \quad (6)$
 $\sqrt{x^2} = \sqrt{84}$
 $x = \pm 2\sqrt{21}$
 $= \pm 9.165$

Ex3. $\frac{5(x-7)^2}{5} = \frac{135}{5}$
 $\sqrt{(x-7)^2} = \sqrt{27}$
 $\frac{x-7}{+7} = \frac{\pm 3\sqrt{3}}{+7}$
 $x = 7 + 3\sqrt{3}$ and $x = 7 - 3\sqrt{3}$
 $= 12.196$ and $= 1.804$

You Try:

4. $\sqrt{x^2} = \sqrt{9}$
 $x = \pm 3$

5. $x^2 - 16 = 0$
 $\frac{+16}{+16} \frac{+16}{+16}$
 $\sqrt{x^2} = \sqrt{16}$
 $x = \pm 4$

6. $12 - 2x^2 = 4$
 $\frac{-12}{-12} \frac{-12}{-12}$
 $\frac{-2x^2}{-2} = \frac{-8}{-2}$
 $\sqrt{x^2} = \sqrt{4}$
 $x = \pm 2$

7. $x^2 - 144 = 0$
 $\frac{+144}{+144} \frac{+144}{+144}$
 $\sqrt{x^2} = \sqrt{144}$
 $x = \pm 12$

8. $\frac{2x^2}{2} = \frac{2}{2}$
 $\sqrt{x^2} = \sqrt{1}$
 $x = \pm 1$

9. $16 - x^2 = -9$
 $\frac{-16}{-16} \frac{-16}{-16}$
 $\frac{-x^2}{-1} = \frac{-25}{-1}$
 $\sqrt{x^2} = \sqrt{25}$
 $x = \pm 5$

10. $3x^2 - 1 = 5$
 $\frac{+1}{+1} \frac{+1}{+1}$
 $\frac{3x^2}{3} = \frac{6}{3}$
 $\sqrt{x^2} = \sqrt{2} \quad x = \pm \sqrt{2}$
 $x = \pm 1.414$

11. $x^2 - 3 = 1$
 $\frac{+3}{+3} \frac{+3}{+3}$
 $\sqrt{x^2} = \sqrt{4}$
 $x = \pm 2$

12. $3x^2 - 1 = 5$
 $\frac{+1}{+1} \frac{+1}{+1}$
 $\frac{3x^2}{3} = \frac{6}{3}$
 $\sqrt{x^2} = \sqrt{2}$
 $x = \pm \sqrt{2}$ or ± 1.414

13. $\frac{x^2}{4} - 3 = 33$
 $\frac{+3}{+3} \frac{+3}{+3}$
 $\frac{x^2}{4} = 36 \quad (4)$
 $\sqrt{x^2} = \sqrt{144}$
 $x = \pm 12$

14. $\sqrt{(x+3)^2} = \sqrt{9}$
 $x+3 = \pm 3$
 $\begin{array}{l} x+3=3 \\ -3 \quad -3 \\ \hline x=0 \end{array} \quad \begin{array}{l} x+3=-3 \\ -3 \quad -3 \\ \hline x=-6 \end{array}$

15. $\sqrt{x^2} = \sqrt{36}$
 $x = \pm 6$

16. $x^2 - 81 = 0$
 $\frac{+81}{+81} \frac{+81}{+81}$
 $\sqrt{x^2} = \sqrt{81}$
 $x = \pm 9$

17. $\frac{5(x-3)^2}{5} = \frac{500}{5}$
 $\sqrt{(x-3)^2} = \sqrt{100}$
 $x-3 = \pm 10$
 $x-3=10 \quad x-3=-10$
 $x=13 \quad x=-7$

18. $\frac{-4x^2}{-4} = \frac{-36}{-4}$
 $\sqrt{x^2} = \sqrt{9}$
 $x = \pm 3$