

Solve by factoring:

- 1) $2x^2 - 3x - 5 = 0$ 2) $x^2 = -9x - 14$ 3) $12x^2 + 13x = 4$ 4) Find the discriminant and nature of roots of $3x^2 + 17 = 8x$

Solve by the square root method:

5) $25x^2 - 4 = 0$ 6) $3(x-2)^2 = 27$

Solve by completing the square:

7) $x^2 + 6x + 7 = 0$ 8) $x^2 - 5x + 1 = 0$

Solve by the quadratic formula:

9) $7x^2 - 2x - 14 = 0$

10) $3x^2 - 2x - 4 = 0$

Solve by the graphing method to find all the real solutions to the following:

11) $|x^4 + x - 3| = 0$

12) $\sqrt{x^4 + x^3 - x - 3} = 0$

13) $\frac{x^3 - 4x + 1}{x^2 + x - 6} = 0$

Write the equations. Use a graphing calculator to solve:

14) A real estate investment yields a return of 9% per year, and a certificate of deposit (CD) pays 5% interest per year. How much of \$2000 should be put in real estate and how much should be put in the CD to earn a return of 6% on the entire \$2000?

15) A radiator contains 9 quarts of fluid, 40% of which is antifreeze. How much fluid should be drained and replaced with pure antifreeze so that the new mixture is 50% antifreeze.

16) The average of two real numbers is 53.5. Their product is 2790. What are the numbers?

17) A pilot wants to make an 840 mile **round trip** from Cleveland, OH to Peoria, IL in 5 hours. There will be a headwind of 30 mph going to Peoria and a 40 mph tailwind returning to Cleveland. At what constant rate of speed should the plane be flown?