

- Amanda left the hardware store and traveled toward the capital at an average speed of 45 km/h. Monty left 2 hours later and traveled in the same direction but with an average speed of 75 km/h. find the number of hours Amanda traveled before Monty caught up to her.
- Danielle wants to make a 6% sugar solution. She has already poured 12 L of pure water into a beaker. How many liters of a 30% sugar solution must she add to this to create the desired mixture?
- Nicole left the hospital driving toward the lake 3.1 hours before Sanjay. Sanjay drove in the opposite direction going 30.5 km/h faster than Nicole for 0.8 hours. At that moment, they were 245.3 km apart. Find Nicole's speed.
- Malik earned \$48,000 from royalties on his book. He invested some of his royalties at 1.5% and the rest he invested at 3.25%. The investments earned a total of \$1275 in interest in one year. Find the amount invested at each rate.

Solve each equation. Remember to check for extraneous solutions.

$$5. \quad r = \sqrt{90 - r}$$

$$6. \quad \sqrt{3x} + 3 = \sqrt{9 - 5x}$$

Find the discriminant and state then number and nature of the solutions.

$$7. \quad 10k^2 + 4k - 3 = -6$$

$$8. \quad 10p^2 + 9p - 4 = 3$$

Solve each equation.

$$9. \quad 7x^2 + 32 = -60x$$

$$10. \quad 22m = -3m^2 + 49 + 8m$$

$$11. \quad 4v^2 - 1 = -21$$

$$12. \quad 4x^2 + 6 = 6x$$

$$13. \quad 4a^2 - 6 = 8a$$

Solve each inequality and graph its solution. Write the solution in interval notation.

$$14. \quad |5 - 7x| + 8 \leq 52$$

$$15. \quad -3|8n - 7| \geq -93$$

$$16. \quad 36 - 2m > -6(-8m - 6)$$

$$17. \quad -3(-a - 3) \geq 13 + 5a$$

$$18. \quad \frac{|10 - 7k|}{7} = 1$$

$$19. \quad 5 + |6x - 7| = 10$$

Solve for x.

20.
$$\frac{x+2}{x^2+5x} = \frac{6}{x} - \frac{1}{x^2+5x}$$

21.
$$\frac{1}{n} = 1 + \frac{n^2 + 5n + 6}{n}$$

22. A realtor borrowed \$90,000 to develop some property. He was able to borrow part of the money at 11.5% interest and the rest at 12%. The annual interest on the two loan amounts is \$10,525. How much was borrowed at each rate?
23. A projectile is fired up from ground level. After t seconds, its height, s , in feet above the ground, is given by $s(t) = -16t^2 + 220t$. At what times is the projectile exactly 750 feet above the ground?
24. Perry plans to replace the vinyl covering in his 10 ft by 12 ft kitchen. He wants to have a border of even width of a special material. He can only afford 21 sq. ft. of border. How wide a border can he have?
25. The lengths of the sides of a right triangle are such that the shortest side is 7 in. shorter than the middle side, while the longest side is 1 in. longer than the middle side. Find the length of all three sides.