

1. Simplify each of the following expressions.

(a) $\sqrt{700} - \sqrt{63} + 2\sqrt{28} =$

(b) $(4 - 3\sqrt{5})^2 =$

(c) $(2\sqrt{6} - 1)^3 =$

(d) $\frac{\sqrt{180}}{\sqrt{125}} =$

2. Rationalize the denominator in each of the following expressions.

(a) $\frac{2}{\sqrt{5} - 1} =$

(b) $\frac{18}{\sqrt{12} - 3} =$

(c) $\frac{4x - 50}{\sqrt{2x} + 5} =$

3. Find the exact value of $a^2 - 10a + 10$ if $a = 5 - 2\sqrt{3}$.

4. Factor each of the following by completing the square or state if it does not factor.

(a) $x^2 - 26x + 185 =$

(b) $20x + x^2 - 525 =$

(c) $64x + 4x^2 - 144 =$

(d) $5x + x^2 - 66 =$

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

(f) $x + 6x^2 - 35 =$

(g) $x^2 - 3x + 1 =$

5. Consider the equation $x^2 + 93 = 20x$

(a) Find the exact value(s) of all solutions of the equation by completing the square.

(b) Check your solution using the exact values.

6. Graph the parabola $y = 8 - x^2 - 2x$. Clearly label the coordinates of five points on the parabola, including vertex and intercepts.

7. Find the distance between $(-3, -5)$ and $(5, 10)$.

8. One side of a rectangle is 5 in shorter than 4 times the other side. Find the sides of the rectangle if its area is 279 in^2 .

9. A book went on a 12% sale. The sale price is \$ 79.20. Find the original price.

10. How much of a 12% solution should be mixed with 6 gallons of a 20% solution to obtain a mixture that is 15%?
11. The hypotenuse of a right triangle is 122 cm. The difference between the other two sides is 98. cm. Find the sides of the triangle.
12. Find all the numbers such that the number squared is equal to the number.
13. Find all the numbers such that the number cubed is equal to the number.