

1. Find the product of $7+3i$ and its conjugate, $(7-3i)$

$$(7+3i)(7-3i) = 49 - 21i + 21i - 9i^2 = 49 + 9 = \boxed{58}$$

2. After applying the distributive property, which of these results in a perfect square trinomial?

A. $(x+5)(x-5)$ B. $x(x-7)$ **C. $(x-3)^2$** D. $(x+6)(x+8)$

$(x-3)(x-3)$

3. Which method of solving can be used for every quadratic equation?

Quadratic Formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

4. Use the Zero Product Property to find all the solutions to the equation

$$8x(x+12)(2x-7) = 0$$

$8x = 0$ $x+12=0$ $2x-7=0$

$x=0$ $x=-12$ $x = \frac{7}{2}$

5. Simplify the radical expressions completely. Rationalize the denominators.

6. $\sqrt{784}$

$\boxed{28}$

7. $\frac{7\sqrt{8} \cdot 9\sqrt{3}}{63\sqrt{8-3}}$

$\boxed{126\sqrt{6}}$

8. $\frac{24\sqrt{7}}{\sqrt{3}\sqrt{5}} = \frac{24\sqrt{7}}{3}$

$\boxed{8\sqrt{3}}$

9. $\sqrt{\frac{48}{25}} = \frac{4\sqrt{3}}{5}$

$\boxed{\frac{4\sqrt{3}}{5}}$

Simplify the complex number expression. Rationalize the denominators. Write answers in standard form.

10. $\sqrt{-128}$

$\boxed{8i\sqrt{2}}$

11. $(7+9i)-8(4-i)$

$\boxed{-25+17i}$

12. $(7+3i)(2-6i)$

$\boxed{32-36i}$

$14 + 42i + 6i - 18i^2$
 $14 + 48i + 18$

14. $\frac{\sqrt{36} + \sqrt{-11}}{6 + \sqrt{11}}$

$\boxed{6 + i\sqrt{11}}$

16. $x^2 - 11x + 28 = 0$ $x = 4, 7$
 $(x-4)(x-7) = 0$
 $x-4=0$ $x-7=0$
 $x=4$ $x=7$

17. $25x^2 - 100 = 0$ $x = 2, -2$
 $(5x)^2 - (10)^2 = 0$
 $(5x-10)(5x+10) = 0$
 $5x-10=0$ $5x+10=0$
 $5x=10$ $5x=-10$
 $x=2$ $x=-2$

18. $6x^2 - 13x + 6 = 0$ $x = \frac{2}{3}, \frac{3}{2}$
 $x^2 - 17x + 36 = 0$ $3x-2=0$
 $(x-4)(x-9) = 0$ $x = \frac{2}{3}$
 $(x-\frac{2}{3})(x-\frac{3}{2}) = 0$ $x = \frac{3}{2}$

SOLVE BY TAKING SQUARE ROOTS

19. $x^2 = 128$ $x = \pm 8\sqrt{2}$
 $x = \pm \sqrt{128}$
 $x = \pm 8\sqrt{2}$

20. $2x^2 + 40 = 0$ $x = \pm 2\sqrt{5}i$
 $2x^2 = -40$
 $x^2 = -20$
 $x = \pm \sqrt{-20}$
 $x = \pm 2\sqrt{5}i$

21. $3(x-5)^2 + 4 = 40$ $x = 5 \pm 2\sqrt{3}$
 $3(x-5)^2 = 36$
 $\sqrt{3(x-5)^2} = \sqrt{36}$
 $|x-5| = 2\sqrt{3}$
 $x = 5 \pm 2\sqrt{3}$

SOLVE USING THE QUADRATIC FORMULA

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

22. $3x^2 + 2x - 7 = 0$ $x = \frac{-1 \pm \sqrt{55}}{3}$
 $a=3, b=2, c=-7$
 $x = \frac{-2 \pm \sqrt{2^2 - 4(3)(-7)}}{2(3)} = \frac{-2 \pm \sqrt{4 + 84}}{6} = \frac{-2 \pm \sqrt{88}}{6}$
 $= \frac{-2 \pm \sqrt{4 \cdot 22}}{6} = \frac{-2 \pm 2\sqrt{22}}{6} = \frac{-1 \pm \sqrt{22}}{3}$

23. $2x^2 - 3x + 2 = 0$ $x = \frac{3 \pm 2\sqrt{5}}{4}$
 $2x^2 - 3x + 2 = 0$
 $a=2, b=-3, c=2$
 $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(2)}}{2(2)} = \frac{3 \pm \sqrt{9-16}}{4}$

24. $x^2 + 20x - 16 = 0$ $x = -10 \pm 2\sqrt{29}$
 $a=1, b=20, c=-16$
 $x = \frac{-20 \pm \sqrt{20^2 - 4(1)(-16)}}{2(1)} = \frac{-20 \pm \sqrt{400 + 64}}{2} = \frac{-20 \pm \sqrt{464}}{2}$
 $= \frac{-20 \pm \sqrt{16 \cdot 29}}{2} = \frac{-20 \pm 4\sqrt{29}}{2} = -10 \pm 2\sqrt{29}$
 $x = \frac{-20 \pm \sqrt{464}}{2} = \frac{-20 \pm 2\sqrt{29}}{1} = -10 \pm 2\sqrt{29}$

$x = \frac{3 \pm \sqrt{5}}{4}, \frac{3 \pm 2\sqrt{5}}{4}$
 $x = \frac{3 \pm \sqrt{5}}{4}$

25. Determine the value of c that must be added to complete the square for each trinomial, then rewrite the perfect square trinomial in binomial form.

a. $x^2 + 20x + \underline{100}$ $\left(\frac{20}{2}\right)^2 = (10)^2 = 100$ binomial form $(x+10)(x+10) = (x+10)^2$

b. $x^2 - 44x + \underline{484}$ $\left(\frac{-44}{2}\right)^2 = (-22)^2 = 484$ binomial form $(x-22)(x-22) = (x-22)^2$

c. $x^2 + 5x + \underline{\frac{25}{4}}$ $\left(\frac{5}{2}\right)^2 = \frac{25}{4}$ binomial form $(x+\frac{5}{2})(x+\frac{5}{2}) = (x+\frac{5}{2})^2$

d. Solve by completing the square: $x^2 - 16x = -8$. Write answer in simplified radical form.

$$\begin{aligned}
 & x^2 - 16x = -8 && \left(\frac{-16}{2}\right)^2 = (-8)^2 = 64 \\
 & x^2 - 16x + \underline{64} = -8 + \underline{64} \\
 & (x-8)(x-8) = 56 \\
 & (x-8)^2 = 56 \\
 & x-8 = \pm\sqrt{56} \\
 & x-8 = \pm 2\sqrt{14} \\
 & x = 8 \pm 2\sqrt{14}
 \end{aligned}$$