CP Algebra 2

Unit 3 Quiz #2 Review

Name: Key

Date: _____ Block: _____

For #1-6, simplify the following square roots. Leave your answer in simplest radical form. (No decimals)

1. $\sqrt{-48}$

$16 \cdot 3$ $4i\sqrt{3}$

2. $-3\sqrt{-49}$

$-3 \cdot 7i$

$-21i$

3. $-\sqrt{-175}$

$25 \cdot 7$

$-5i\sqrt{7}$

4. $\frac{3}{2}\sqrt{-12}$

$\frac{3}{2} \cdot 2i\sqrt{3}$

$3i\sqrt{3}$

5. $\sqrt{-224}$

$16 \cdot 14$

$4i\sqrt{14}$

6. $-\frac{1}{4}\sqrt{-8}$

$-\frac{1}{4} \cdot 2i\sqrt{2}$

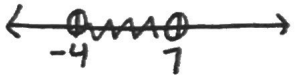
$-\frac{1}{2}i\sqrt{2}$

For #7-9, solve the quadratic inequality and write the result in interval notation.

7. $x^2 - 3x - 4 < 24$ → $-4 < 24$ T

$x^2 - 3x - 28 < 0$

$(x-7)(x+4)$ $x = 7$ $x = -4$



$(-4, 7)$

8. $3x^2 - 21x \geq 0$ → $3 - 21 \geq 0$ $-18 \geq 0$ F

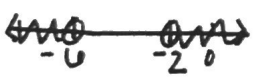
$3x(x-7) \geq 0$ $x = 0$ $x = 7$

$(-\infty, 0] \cup [7, \infty)$

9. $x^2 + 8x + 12 > 0$ $12 > 0$ ✓

$(x+6)(x+2)$

$x = -6$ $x = -2$



$(-\infty, -6) \cup (-2, \infty)$

10. $2x^2 + 12x + 10 \leq 0$

$(2x+10)(x+1)$ $x = -5$ $x = -1$

$[-5, -1]$

For #10-15, find the discriminant of the functions. Identify how many and what type of solutions. Then solve using the quadratic formula.

10. $x^2 - 4x + 5 = 0$

$(-4)^2 - 4(1)(5)$

$16 - 20 = -4$ → $\frac{4 \pm \sqrt{-4}}{2}$

$\frac{4 \pm 2i}{2}$ → $2 \pm i$

Disc: -4

Type of Sol: 2 imag/comp.

Solutions: $2 \pm i$

11. $x^2 + 6x + 13 = 0$

$6^2 - 4(1)(13)$

$36 + 52$

88

$\frac{-6 \pm \sqrt{88}}{2}$ → $\frac{-6 \pm 2\sqrt{11}}{2}$

Disc: 88

Type of Sol: 2 real sol.

Solutions: $-3 \pm \sqrt{11}$

12. $x^2 + 6x + 5 = 0$

$(6)^2 - 4(1)(5)$

$36 - 20 = 16$

$\frac{-6 \pm \sqrt{16}}{2} \rightarrow \frac{-6 \pm 4}{2}$

Disc: 16

Type of Sol: 2 real sol.

Solutions: $x = -1 \quad x = -5$

13. $x^2 + 4x + 2 = 0$

$(4)^2 - 4(1)(2)$

$16 - 8 = 8$

$\frac{-4 \pm \sqrt{8}}{2}$

$\frac{-4 \pm 2\sqrt{2}}{2}$

Disc: 8

Type of Sol: 2 real sol

Solutions: $-2 \pm \sqrt{2}$

14. $x^2 - 5x + 8 = 0$

$(-5)^2 - 4(1)(8)$

$25 - 32 = -7$

$\frac{5 \pm i\sqrt{7}}{2}$

Disc: -7

Type of Sol: 2 imag/comp.

Solutions: $\frac{5 \pm i\sqrt{7}}{2}$

15. $x^2 - 3x + 10 = 0$

$(-3)^2 - 4(1)(10)$

$9 - 40 = -31$

$\frac{3 \pm \sqrt{-31}}{2} \rightarrow \frac{3 \pm i\sqrt{31}}{2}$

Disc: -31

Type of Sol: 2 imag/comp.

Solutions: $\frac{3 \pm i\sqrt{31}}{2}$

For #16-27, solve using any method.

16. $x^2 - 7x - 3 = 0$

$(-7)^2 - 4(1)(-3)$

$49 + 12 = 61$

$\boxed{\frac{7 \pm \sqrt{61}}{2}}$

17. $x^2 + 5x - 6 = 0$

$(x + 6)(x - 1)$

$\boxed{x = -6 \quad x = 1}$

18. $x^2 - 6x = 0$

$x(x - 6) = 0$

$\boxed{x = 0 \quad x = 6}$

19. $2x^2 - 7x + 3 = 0$

$2x^2 - 6x - x + 3$

$2x(x - 3) - 1(x - 3)$

$(2x - 1)(x - 3)$

$\boxed{x = 1/2 \quad x = 3}$

20. $3x^2 - 5x + 6 = -4$

$3x^2 - 5x + 10 = 0$

$(-5)^2 - 4(3)(10)$

$25 - 120 = -95$

$\frac{5 \pm \sqrt{-95}}{6} \rightarrow \boxed{\frac{5 \pm i\sqrt{95}}{6}}$

21. $x^2 + 11x = 3x - 10$

$x^2 + 8x + 10 = 0$

$(8)^2 - 4(1)(10)$

$64 - 40 = 24$

$\frac{-8 \pm \sqrt{24}}{2} \rightarrow \frac{-8 \pm 2\sqrt{6}}{2} \rightarrow \boxed{-4 \pm \sqrt{6}}$

22. $14 - 3x^2 = 2x$

$3x^2 + 2x - 14$

$(2)^2 - 4(3)(-14)$

$4 + 168 \quad \frac{-2 \pm \sqrt{172}}{2 \cdot 3}$

172

$\frac{-2 \pm 2\sqrt{43}}{6} = \boxed{\frac{-1 \pm \sqrt{43}}{3}}$

23. $7 - 8x^2 = 6x + 16$

$8x^2 + 6x + 9 = 0$

$6^2 - 4(8)(9) \quad \frac{-6 \pm \sqrt{-252}}{2 \cdot 8}$

$36 - 288$

$-252 \quad \frac{-6 \pm 6i\sqrt{7}}{16} \rightarrow \boxed{\frac{-3 \pm 3i\sqrt{7}}{8}}$

24. $5x^2 - 125 = 0$

$5x^2 = 125$

$x^2 = 25$

$\boxed{x = \pm 5}$

25. $2(x + 1)^2 - 3 = 7$

$2(x+1)^2 = 10$

$(x+1)^2 = 5$

$x + 1 = \pm\sqrt{5}$

$\boxed{x = -1 \pm \sqrt{5}}$

26. $x^2 + 24x + 75 = -5$

$x^2 + 24x + 80 = 0$

$(x + 20)(x + 4)$

$\boxed{x = -20 \quad x = -4}$

27. $3x^2 - 12x + 15 = -15$

$3x^2 - 12x + 30 = 0$

$(-12)^2 - 4(3)(30)$

$144 - 360$

-216

$\frac{12 \pm \sqrt{-216}}{2 \cdot 3}$

$\frac{12 \pm 6i\sqrt{6}}{6}$

$\boxed{2 \pm i\sqrt{6}}$