NAME Key DATE _____ SCORE _____

Completing the Square; The Quadratic Formula

& split complex answers

Solve over the set of complex numbers by completing the square.

1. $a^2 - 4a + 1 = 0$ $2 \pm \sqrt{3}$
2. $z^2 + 3z - 2 = 0$ $\frac{-3 \pm \sqrt{17}}{2}$
3. $c^2 - c - 3 = 0$ $\frac{1 \pm \sqrt{13}}{2}$
4. $x^2 + 5x + 5 = 0$ $\frac{-5 \pm \sqrt{5}}{2}$
5. $2e^2 + 2e - 1 = 0$ $\frac{-1 \pm \sqrt{3}}{2}$
6. $3v^2 - 6v + 2 = 0$ $\frac{3 \pm \sqrt{3}}{3}$
7. $2b^2 + 7b + 4 = 0$ $\frac{-7 \pm \sqrt{17}}{4}$
8. $y^2 + 4y + 5 = 0$ $-2 \pm i$
9. $d^2 + 2d + 5 = 0$ $-1 \pm 2i$
10. $w^2 + 3w + 4 = 0$ $\frac{-3 \pm i\sqrt{7}}{2} \rightarrow -\frac{3}{2} \pm \frac{i\sqrt{7}}{2}$
11. $f^2 + 5f + 9 = 0$ $\frac{-5 \pm i\sqrt{11}}{2} \rightarrow -\frac{5}{2} \pm \frac{i\sqrt{11}}{2}$
12. $y^2 + 3y + 3 = 0$ $\frac{-3 \pm i\sqrt{3}}{2} \rightarrow -\frac{3}{2} \pm \frac{i\sqrt{3}}{2}$
13. $3h^2 - 2h + 1 = 0$ $\frac{1 \pm i\sqrt{2}}{3} \rightarrow \frac{1}{3} \pm \frac{i\sqrt{2}}{3}$
14. $3u^2 + 4u + 3 = 0$ $\frac{-2 \pm i\sqrt{5}}{3} \rightarrow -\frac{2}{3} \pm \frac{i\sqrt{5}}{3}$

Solve over the set of complex numbers by using the quadratic formula.

15. $m^2 + m - 3 = 0$ $\frac{-1 \pm \sqrt{13}}{2}$
16. $r^2 + 2r - 1 = 0$ $-1 \pm \sqrt{2}$
17. $2n^2 + 3n - 1 = 0$ $\frac{-3 \pm \sqrt{17}}{4}$
18. $2s^2 + 4s = -1$ $\frac{-2 \pm \sqrt{2}}{2}$
19. $p^2 + 5p = -3$ $\frac{-5 \pm \sqrt{13}}{2}$
20. $t^2 + 2t + 3 = 0$ $-1 \pm i\sqrt{2}$
21. $u^2 + 5u + 7 = 0$ $\frac{-5 \pm i\sqrt{3}}{2} \rightarrow -\frac{5}{2} \pm \frac{i\sqrt{3}}{2}$
22. $2b^2 + 3b + 3 = 0$ $\frac{-3 \pm i\sqrt{15}}{4} \rightarrow -\frac{3}{4} \pm \frac{i\sqrt{15}}{4}$
23. $5v^2 + 4v + 3 = 0$ $\frac{-2 \pm i\sqrt{11}}{5} \rightarrow -\frac{2}{5} \pm \frac{i\sqrt{11}}{5}$
24. $2c(c + 2) = -5$ $\frac{-2 \pm i\sqrt{6}}{2} \rightarrow -1 \pm \frac{i\sqrt{6}}{2}$

25. The length of a rectangle is 2 cm more than the width. If the area is 5 cm², find the dimensions. Give your answer in radical form.

$-1 + \sqrt{6}$ cm by $1 + \sqrt{6}$ cm

26. The product of a real number and another real number 6 less than the first is 3. What are the numbers? Give your answers in radical form.

$3 + 2\sqrt{3}$, $-3 + 2\sqrt{3}$
or $3 - 2\sqrt{3}$, $-3 - 2\sqrt{3}$