Algebra 2 H Name_____

Quadratics and the Discriminant

Date_____ Period____

Find the discriminant of each quadratic equation then state the number and type of solutions.

1) $5r^2 - 2r - 5 = 2$

2) $-3p^2 + 6p + 12 = 3$

3) $-3r^2 = 8 - 10r$

4) $-10x^2 = 3x + 7$

5) $2n^2 + 17n + 8 = 9n$

6) $3r^2 - r + 6 = -1$

Solve each equation. Check your solutions in the original equation.

7) $7r^2 - 21 = 0$

8) $8x^2 - 9x - 16 = 0$

9) $4a^2 + 10a - 104 = 0$

10) $12b^2 - 6b + 8 = 0$

Solve each equation. Remember to check for extraneous solutions.

11) $\frac{x^2}{x+4} = \frac{x^2 - 36}{x+4} - 1$

12) $\frac{b+6}{b-1} = \frac{1}{b-1} + \frac{6b+6}{b^2 - b}$

Solve each equation by completing the square.

13) $5n^2 - 20n - 56 = 4$

14) $3n^2 + 12n - 89 = 7$

15) $2k^2 - 20k - 83 = -8$

16) $5b^2 + 10b - 38 = 2$

Solve each equation by factoring.

17) $3x^2 - 126 = -3x$

18) $r^2 - 40 = -3r$

19) $7r^2 = -7r$

20) $7b^2 = -175 - 70b$

Solve each equation by taking square roots.

21) $3b^2 + 9 = -6$

22) $4v^2 + 10 = 74$

23) $100a^2 - 1 = 24$

24) $10p^2 - 10 = -114$

Solve each equation with the quadratic formula.

25) $8v^2 + 8 = -4v$

26) $8n^2 - 14 = 0$

27) $12k^2 + 5 = 3k$

28) $6n^2 = -4$

Solve each equation. Remember to check for extraneous solutions.

29) $\frac{3}{2} = \frac{1}{2p^2} + 1$

30) $\frac{b^2 + 2b + 1}{3b} = \frac{1}{3} + 1$

31) $\frac{x - 3}{x^2} + \frac{3x^2 - 30x + 72}{x^2} = \frac{1}{4x^2}$

32) $\frac{1}{4n^3} = \frac{5n + 3}{4n^2} - \frac{2n - 1}{4n^3}$

Answers to Quadratics and the Discriminant

1) 144; two real solutions
2) 144; two real solutions
3) 4; two real solutions
4) −271; two imaginary solutions
5) 0; one real solution
6) −83; two imaginary solutions
7) $\{\sqrt{3}, -\sqrt{3}\}$
8) $\left\{\frac{9+\sqrt{593}}{16}, \frac{9-\sqrt{593}}{16}\right\}$
9) $\left\{4, -\frac{13}{2}\right\}$
10) $\left\{\frac{3+i\sqrt{87}}{12}, \frac{3-i\sqrt{87}}{12}\right\}$
11) $\{-40\}$
12) $\{3, -2\}$
13) $\{6, -2\}$
14) $\{4, -8\}$
15) $\left\{\frac{10+5\sqrt{10}}{2}, \frac{10-5\sqrt{10}}{2}\right\}$
16) $\{2, -4\}$
17) $\{6, -7\}$
18) $\{-8, 5\}$
19) $\{-1, 0\}$
20) $\{-5\}$
21) $\{i\sqrt{5}, -i\sqrt{5}\}$
22) $\{4, -4\}$
23) $\left\{\frac{1}{2}, -\frac{1}{2}\right\}$
24) $\left\{\frac{2i\sqrt{65}}{5}, -\frac{2i\sqrt{65}}{5}\right\}$
25) $\left\{\frac{-1+i\sqrt{15}}{4}, \frac{-1-i\sqrt{15}}{4}\right\}$
26) $\left\{\frac{\sqrt{7}}{2}, -\frac{\sqrt{7}}{2}\right\}$
27) $\left\{\frac{3+i\sqrt{231}}{24}, \frac{3-i\sqrt{231}}{24}\right\}$
28) $\left\{\frac{i\sqrt{6}}{3}, -\frac{i\sqrt{6}}{3}\right\}$
29) $\{1, -1\}$
30) $\{1\}$
31) $\left\{\frac{11}{2}, \frac{25}{6}\right\}$
32) $\left\{-\frac{1}{5}\right\}$