Classifying Discontinuities

Date_____ Period____

Determine if each function is continuous. If the function is not continuous, find the *x*-axis location of, and classify each, discontinuity with justification.

1) $h(w) = \begin{cases} -w - 1, & w \le -3 \\ \frac{w}{2} + \frac{7}{2}, & w > -3 \end{cases}$

2) $f(x) = \begin{cases} x, & x \le \frac{3}{2} \\ -x^2 - 2x, & x > \frac{3}{2} \end{cases}$

3) $g(s) = \begin{cases} \frac{7}{4} - s^2 + s, & s \ne \frac{3}{2} \\ 1, & s = \frac{3}{2} \end{cases}$

4) $f(r) = \dfrac{r + 1}{2r^2 + 2r + 1}$

5) $g(t) = \begin{cases} t^2 - 4t + 4, & t \ne 1 \\ 1, & t = 1 \end{cases}$

6) $f(s) = \dfrac{s + 5}{s^2 - \frac{s}{2} - 3}$

7) $f(s) = \dfrac{s^2 + 4s}{s}$

8) $f(r) = \begin{cases} -r^2 - 6r - 9, & r < -1 \\ -4, & r \geq -1 \end{cases}$

9) $h(s) = \begin{cases} -2 - \dfrac{s}{2}, & s \neq -1 \\ -5, & s = -1 \end{cases}$

10) $f(x) = \begin{cases} -x^2 + 2x, & x \leq \dfrac{1}{2} \\ -3, & x > \dfrac{1}{2} \end{cases}$

11) $g(x) = \cot(2x);\ [-\pi, \pi]$

12) $g(x) = -\dfrac{x^2}{2x + 1}$