Name_____ Date_____

4.5 Extra Practice

In Exercises 1–6, solve the equation.

1. $36r^3 - r = 0$

2. $20x^3 + 80x^2 = -60x$

3. $3m^2 = 75m^4$

4. $-13y^2 + 36 = -y^4$

5. $2x^3 - x^2 - 2x = -1$

6. $-20c^2 + 50c = 8c^3 - 125$

In Exercises 7–10, find the zeros of the function. Then sketch a graph of the function.

7. $f(x) = x^4 - x^3 - 12x^2$

8. $f(x) = -4x^3 + 12x^2 - 9x$

9. $f(x) = x^3 + 4x^2 - 6x - 24$

10. $f(x) = x^4 - 18x^2 + 81$

11. Find all the real solutions of $x^3 - 8x^2 - 21x + 108 = 0$.

12. Find all the real zeros of $f(x) = 3x^4 + 11x^3 - 40x^2 - 132x + 48$.

13. Write a polynomial function g of least degree that has rational coefficients, a leading coefficient of 1, and the zeros -5 and $4 + \sqrt{2}$.

14. ~~All the possible rational solutions and actual rational solutions of the~~ equation ~~below are shown.~~ Complete the equation.

~~**Possible:** $\pm 1, \pm 2, \pm 3, \pm 6, \pm\frac{1}{2}, \pm\frac{3}{2}$~~

~~**Actual:** $-3, \frac{1}{2}$~~

~~$(x + \_\_\_\_)(x + \_\_\_\_)(x^2 + \_\_\_\_) = 0$~~