Self – Diagnostic Exam Solutions

1. $\frac{x^4}{yz^8}$ ***(Simplifying rational expressions)***

2. $\frac{m^{4x}}{m^{7y}}$ ***(Simplifying exponents)***

3. $2(y^2+4x^2)(y-2x)(y+2x)$ ***(Factoring polynomials)***

4. $\frac{x-3}{x^2+4x+3}$ or $\frac{x-3}{(x+1)(x+3)}$ ***(Adding/subtracting rational expressions)***

5. $-3(1+\sqrt{2})$ ***(Rationalizing the denominator)***

6. $\frac{2x}{y}$ ***(Simplifying rational expressions)***

7. 16 ***(Simplifying radicals as exponents)***

8. $\frac{ab-1}{a-b}$ ***(Multiplying polynomials/solving for a variable)***

9. $\frac{40x+5}{60x-4}$ ***(Simplifying rational expressions; complex fractions)***

10. There are no real solutions ***(Solving radical equations)***

11. 3 feet ***(Using area of a given shape in a real-world scenario)***

12. 375 miles ***(Distance = Rate * Time; rate of change)***

13. $(x-2)^2=1$ ***(Completing the square)***

14. $y=7x$ ***(Introduction to functions)***

15. $-\frac{1}{9}$ ***(Linear system of equations)***

16. $2xh+h^2$ ***(New functions from old; transformations)***

17. $\sqrt{x^2-6x}$ ***(New functions from old; transformations)***

18. All x less than 9 ***(domain/range of rational expressions)***

19. $y=-3x+7$ ***(Linear functions)***

20. $25^{o}C$ ***(Using linear functions to model real-world data)***

21. 2 ***(Composite functions)***

22. $(-\frac{\sqrt{2}}{2},\frac{\sqrt{2}}{2})$ and $(\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2})$ ***(Non-linear system of equations)***

23. Vertex: (-3,12); maximum: 12 ***(Standard form of quadratic functions)***

24. $-\frac{17}{2} \le x \le \frac{3}{2}$ ***(Solving inequalities)***

25. $x \ge \frac{8}{3}$ or $x \le -\frac{4}{3}$ ***(Solving inequalities involving absolute value)***

26. $-6 \le x \le 6$ ***(Solving inequalities)***

27. Roots: 3 and 4; each has multiplicity of 2 ***(Roots of quadratic function; multiplicity)***

28. -0.25 ***(Exponential functions; powers with like bases)***

29. 0.5 ***(Properties of logarithms)***

30. The point is on the unit circle ***(Definition of unit circle)***

31. $\frac{7\pi}{4}$ ***(Definition of unit circle)***

32. 0 ***(Evaluating trigonometric functions)***

33. 150^{o} ***(Definition of unit circle)***

34. $\sin(\theta)$ ***(Sum/difference trigonometric identities)***

35. $\frac{3}{4}$ ***(Right angle definitions for sin, cos, tan)***

36. $\frac{11\pi}{6}$ ***(Arc length)***

37. $\frac{x}{y}$ ***(Inverse trigonometric identities)***

38. π ***(Properties of trigonometric functions; period)***

39. $\sin(\theta)$ ***(Inverse trigonometric identities)***

40. 1 ***(Pythagorean identities)***

Problems Numbered:	Topics Covered:
1-7	Basic concepts of Algebra
8-15	Equations, Inequalities, and Problem Solving
16-22	Functions and Graphs
23-27	Polynomial and Rational Functions
28-29	Exponential and Logarithmic Functions
30-40	Trigonometric Functions and Identities