Algebra II Second Semester Practice Final Exam

1. Simplify $(3x^0y^{-4})(2x^2y)^3$ $\frac{24x^6}{y}$

$(3x^0y^{-4})(2^3x^6y^3)$

$\frac{3x^0 \cdot 8 \cdot x^6 \cdot y^3}{y^4} = \frac{3 \cdot 1 \cdot 8 \cdot x^6 \cdot y^3}{y^4}$

$= \frac{24x^6}{y}$

2. Simplify $\frac{7y^4z^2}{21y^9}$

$\frac{1z^2}{3y^5}$

3. Express 70,000,000 in scientific notation. 7×10^7

4. Simplify $(3a^3 - 7a^2 + a) - (6a^3 - 4a^2 - 8)$

$-3a^3 - 3a^2 + a + 8$

$(3a^3 - 7a^2 + a) + (-6a^3 + 4a^2 + 8)$

5. Simplify $7x(4x^2 - 3y)$

$28x^3 - 21xy$

$28x^3 - 21xy$

6. Simplify $(x^2+12x+35)\div(x+5)$

$x+7$

$$\begin{array}{r|rrr} -5 & 1 & 12 & 35 \\ & \downarrow & -5 & -35 \\ \hline & 1 & 7 & 0 \end{array}$$

7. Factor $m^2+10m+16$ completely.

$(m+8)(m+2)$

$\times 16 \mid +10$

$8, 2$

$(m+8)(m+2)$

8. Factor $x^3 - 4x^2 + 3x - 12$ completely

$(x^2+3)(x-4)$

$x^2(x-4) + 3(x-4)$

$(x^2+3)(x-4)$

9. Factor $x^2 - 25$ completely.

$(x-5)(x+5)$

$(x-5)(x+5)$

10. Factor $2x^2+13x-7$ completely.

$(x+7)(2x-1)$

$(2x^2-1x+14x-7)$

$x(2x-1)+7(2x-1)$

$(x+7)(2x-1)$

x -14	+13
-1, 14	13

11. Simplify $\sqrt{196}$ 14

12. Use a calculator to approximate $\sqrt{341}$ to three decimal places. 18.466

13. Simplify $\sqrt{80}$

$\sqrt{16} \cdot \sqrt{5}$

$4\sqrt{5}$

$4\sqrt{5}$

14. Simplify $(4+\sqrt{5})(6-\sqrt{5})$

$19+2\sqrt{5}$

$24-4\sqrt{5}+6\sqrt{5}-\sqrt{25}$

$\sqrt{25}=5$

$19+2\sqrt{5}$

15. Simplify $\sqrt{98}-\sqrt{72}+\sqrt{32}$

$5\sqrt{2}$

$\sqrt{49}\sqrt{2}-\sqrt{36}\sqrt{2}+\sqrt{16}\sqrt{2}$

$7\sqrt{2}-6\sqrt{2}+4\sqrt{2}$

$5\sqrt{2}$

16. Simplify $\sqrt[3]{216x^{12}}$

$6x^4$

$\sqrt[3]{216}$ $\sqrt[3]{x^{12}}$

$6x^4$

17. Write the expression $x^{\frac{3}{7}}$ in radical form.

$\sqrt[7]{x^3}$

18. Evaluate $125^{\frac{1}{3}}$

5

$\sqrt[3]{125} = 5$

19. Solve $\sqrt{4x+1}=3$

$(\sqrt{4x+1})^2 = 3^2$

$4x+1=9$

$-1 \quad -1$

$4x=8$

$\frac{4}{4} \quad \frac{8}{4}$

$x=2$

2

$\sqrt{2(4)+1} = 3$

$\sqrt{9} = 3$

$3=3$

20 Solve $\sqrt{x+7}+8=3$

$-8 \quad -8$

$(\sqrt{x+7})^2 = (-5)^2$

$x+7=25$

$-7 \quad -7$

$x=18$

$\emptyset$

$\sqrt{18+7}+8=3$

$\sqrt{25}+8=3$

$5+8=3$

$13 \neq 3$

21. Simplify $\sqrt{-25}$ _____

22. Simplify $(-8+7i)+(22-11i)$ _____

23. What is the equation of the axis of symmetry of $y = x^2 + 16x + 20$? _____

24. The graph of $f(x) = -5x^2 + x$ opens _____ and

has a _____ value. _____

25. Solve $x^2 - 9x - 22 = 0$ _____

26. Solve $3x^2 - 6x = 0$ _____

27. Which quadratic has roots $-\frac{1}{3}, -3$? _____

28. Find the value of c that makes $x^2 + 12x + c$ a perfect square. _____

29. Find the exact solutions to $x^2 + 3x + -3 = 0$ by using the quadratic formula. _____

30. Use the value of the discriminant to determine the number and type of roots for $x^2 - 16x + 4 = 0$. _____

31. Use the value of the discriminant to determine the number and type of roots for $x^2 - x + 6 = 0$. _____

32. Factor x^3+8 completely _____

33. Simplify $\frac{18}{6-\sqrt{2}}$ _____

34. Multiply (x+5)(x-7) _____

35. Simplify $(3x+8)^2$ _____

Answer Key

1. $\frac{24x^6}{y}$
2. $\frac{z^2}{3y^5}$
3. 7×10^7
4. $-3a^3-3a^2+a+8$
5. $28x^3-21xy$
6. x+7
7. $(m+8)(m+2)$
8. $(x^2+3)(x-4)$
9. $(x-5)(x+5)$
10. $(2x-1)(x+7)$
11. 14
12. 18.466
13. $4\sqrt{5}$
14. $19+2\sqrt{5}$
15. $5\sqrt{2}$
16. $6x^4$
17. $\sqrt[7]{x^3}$
18. 5
19. 2

20. No Solution

21. 5i

22. 14 – 4i

23. x = -8

24. down, maximum

25. 11, -2

26. 0, 2

27. $3x^2+10x+3=0$

28. 36

29. $\frac{-3\pm\sqrt{21}}{2}$

30. 2 real irrational roots

31. 2 complex roots

32. $(x+2)(x^2-2x+4)$

33. $\frac{54+9\sqrt{2}}{17}$

34. $x^2-2x-35$

35. $9x^2+48x+64$