

Name: _____

I. Rules of radicals. Matching. The number is to be matched with the letter and must be one of the rules of radicals. **5 points each**

_____1. $\sqrt[n]{ab}$

a. $\sqrt{\frac{a}{b}}$

_____2. $\frac{\sqrt{a}}{\sqrt{b}}$

b. $\sqrt[m]{a}$

_____3. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}}$

c. $\sqrt[n]{\frac{a}{b}}$

_____4. $a^{\frac{1}{n}}$

d. $\sqrt[n]{a}\sqrt[n]{b}$

_____5. $|a|$

e. $\sqrt{a}\sqrt{b}$

_____6. \sqrt{ab}

f. $a^{\frac{m}{n}}$

_____7. $\sqrt[n]{a^m}$

g. $\sqrt{a^2}$

_____8. $\sqrt[n]{\sqrt[m]{a}}$

h. $\sqrt[n]{a}$

II. Factoring, products and fractions. Matching. The number is to be matched with a letter and must yield one of the rules (or simple application of rule) of factoring, products or fractions. **5 points each**

_____9. $a^2 + 2ab + b^2$

a. $(a + b)(a^2 - ab + b^2)$

_____10. $(2a + 3b)^2$

b. $a^2 - 2ab + b^2$

_____11. $(a - b)^2$

c. $\frac{ad}{bc}$

_____12. $a^3 + b^3$

d. $\frac{ac}{bd}$

_____13. $a/c + b/c$

e. $4a^2 + 12ab + 9b^2$

_____14. $\frac{ak}{bk}$

f. $\frac{ab}{c}$

_____15. $\frac{a}{b} \div \frac{c}{d}$

g. $4a^2 + 9b^2$

_____16. $a \times \frac{b}{c}$

h. $\frac{a}{b}$

_____17. $\frac{a}{b} \times \frac{c}{d}$

i. $(a + b)^2$

j. $\frac{ab}{ac}$

k. $\frac{a+b}{c}$

III. Rules of exponents. Given the right or left hand side of the rule, give the other side. **5 points each**

18. $\frac{a^n}{b^n} =$

19. $a^n b^n =$

20. $a^{mn} =$

21. $\frac{a^m}{a^n} =$

22. $a^{-n} =$

23. $a^0 =$

IV. Problems. **5 points each**

24. State whether $-\frac{1}{3} < -\frac{1}{4}$ is true or false.

25. Evaluate $|-60|$.

26. Evaluate **exactly** $|\sqrt{7} - 2.7|$

27. Evaluate 2^{-3} .

28. Perform the operation and write as a power of z: $z^{-4} z^{12}$

29. Write as a power of y: $y^3 \sqrt{y}$

30. Simplify: $\frac{\sqrt{48}}{\sqrt{9}}$

31. Expand the product: $4(x - 2) - 3(2x + 10)$

32. Expand the product: $(x + 5y)^2$

33. Expand the product: $(x + 5y)(x - 5y)$

34. Factor completely: $5(a + b) - 8(a + b)c$

35. Factor completely: $25t^2 - 36$

36. Add: $\frac{3}{10} + \frac{5}{8}$

37. Add: $\frac{3x}{w} - \frac{4x}{w} + \frac{3z}{w}$

V. Problems. **10 points each.**

38. For $(3x^7)^2 x^{-5}$ eliminate negative exponents and simplify.

39. Write as a power of x. $\frac{(x^2)^n x^5}{x^n}$

40. Compute the distance from the point (5,0) to the point (0, 12)

41. Add the fractions: $\frac{x}{x^2 - 9} + \frac{1}{x - 3}$

42. Perform the operation and simplify completely: $\left(\frac{x}{2} - 1\right) \div \frac{x - 2}{2}$

43. Perform the operation and simplify completely $\frac{x^2 - 4}{x^4 - 2x^2 - 8} \times \frac{x^2 + 2}{x}$