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.* $\sqrt[mn]{a}$
_____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. $\lvert a \rvert$	*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. Rules of exponents. Given the right or left hand side of the rule, give the other side. **5 points each**

1. $\left(\frac{a}{b^n}\right)^n =$	2 $a^n b^n =$
3 $a^{mn} =$	4. $\frac{a^m}{a^n} =$
5. $a^{-n} =$	6. $a^0 =$
7. $a^{m+n} =$	8. $a^1 =$

III. Factoring, products and fractions. Matching. The number is to matched with a letter and must yield one of the rules (or simple application of rule) of factoring, products or fractions. **5 points each. There may be no match for some.**

_____	1.	$a^2+2ab+b^2$	a.	$(a+b)(a^2-ab+b^2)$
_____	2.	$(2a+3b)^2$	b.	$a^2-2ab+b^2$
_____	3.	$(a-b)^2$	c.	$\frac{ad}{bc}$
_____	4.	a^3+b^3	d.	$\frac{ac}{bd}$
_____	5.	$\frac{a}{c}+\frac{b}{c}$	e.	$4a^2+12ab+9b^2$
_____	6.	$\frac{ak}{bk}$	f.	$\frac{ab}{c}$
_____	7.	$\frac{a}{b}\div\frac{c}{d}$	g.	$4a^2+9b^2$
_____	8.	$a\times\frac{b}{c}$	h.	$\frac{a}{b}$
_____	9.	$\frac{a}{b}\times\frac{c}{d}$	i.	$(a+b)^2$
_____	10.	$(a-b)^3$	k.	$\frac{a+b}{c}$
_____	11.	$a(b+c)$	l.	$\frac{ak^2}{b}$

IV. Problems. **5 points each**

1. State whether $-\frac{1}{5}<-\frac{1}{4}$ is true or false.
2. Evaluate |-100|.
3. Evaluate **exactly** $|3-p|$

4. Evaluate 3^{-2}.
5. Perform the operation and write as a power of z: $z^{-4}z^{20}$
6. Simplify $\sqrt{8}+\sqrt{50}$
7. Write as a power of y: $y^2\sqrt[5]{y}$
8. Simplify: $\dfrac{\sqrt{48}}{\sqrt{9}}$
9. Expand the product: 3(x - 2) - 5(2x +10)
10. Expand the product: $(r+4q)^2$
11. Expand the product: $(r+4q)(r-4q)$
12. Factor completely: 5(a + b) - 8(a + b)c
13. Factor completely: $9x^2-16$
14. Add: $\dfrac{3}{10}+\dfrac{5}{8}$
15. Add: $\dfrac{3x}{w}-\dfrac{4x}{w}+\dfrac{3z}{w}$
16. What is the midpoint of the points (1, 4) and (4, 8)?

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

1. For $(3x^7)^2\,x^{-5}$ eliminate negative exponents and simplify.
2. Write as a power of x. $\dfrac{(x^2)^n x^5}{x^n}$
3. Compute the distance from the point (5,0) to the point (0, 12)
4. Factor $2x^2+7x-4$
5. Add the fractions $\dfrac{x}{x-4}-\dfrac{3}{x+6}$
6. Eliminate negative exponents and simplify: $\dfrac{\left(y^{10}z^{-5}\right)^{1/5}}{\left(y^{-2}z^3\right)^{1/3}}$
7. Simplify completely: $\dfrac{x^3-4x}{x^2+x-2}$

8. Perform the operation and simplify completely: $\dfrac{1}{1+\dfrac{1}{1+x}}$

9. Factor completely: $(t-1)^2-49$

10. Multiply and simplify completely: $\dfrac{4y-16}{5y+15}\bullet\dfrac{2y+6}{4-y}$

11. Factor $8t^3-125u^3$

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