**#1 RATIONAL EXPRESSIONS** *Directions:* Simplify the following expressions and identify any restrictions.

1. $\frac{9x^{2}yz}{24xyz^{2}}$ 2. $\frac{a+3}{a^{2}+4a+3}$ 3.$ \frac{3x-15}{x^{2}-7x+10}$ 4. $\frac{x^{2}-2x-15}{x^{2}-x-12}$

5. $\frac{14x^{2}+35x+21}{12x^{2}+30x+18}$ 6. $\frac{42y^{3}z^{2}}{14y^{2}z^{3}}$ 7. $\frac{x^{2}-36}{2x-12}$ 8. $\frac{c^{2}+4c-12}{c^{2}+2c-8}$

**#2 RATIONAL EQUATIONS** *Directions:* Solve the following completely. Remember to check for extraneous roots.

Answers in no particular order (not all answers will be used): **»0** **»1 »-**$\frac{5}{4}$ **»8 »-27 »no solution**

1. $\frac{9-a}{a^{2}}=\frac{-4}{3a}$ 2. $\frac{x-5}{x^{2}}+\frac{1}{x}=\frac{6}{x}$
2. $\frac{4}{n+1}+\frac{1}{n^{2}-5n-6}=\frac{1}{n-6}$ 4. $\frac{1}{a+1}+\frac{1}{a-1}$ = $\frac{2}{a^{2}-1}$
3. Ms. Santos partially solved the following equation: $\frac{5}{p+6}-\frac{1}{p^{2}+6p}=\frac{2}{p^{2}+6p}$ Fill in her missing steps.

**#3 LOGARITHMS & RATIONAL EXPONENTS** *Directions:* Write each expression in radical form.

1) $7^{\frac{1}{2}}$ 2) $4^{\frac{4}{3}}$ 3) $2^{\frac{5}{3}}$ 4) $7^{\frac{4}{3}}$ 5) $6^{\frac{3}{2}}$ 6) $2^{\frac{1}{6}}$

*Directions:* Write each expression in exponential form.

1) ($\sqrt{10}$)3 2) $\sqrt[6]{2}$ 3) $(\sqrt[4]{2})$5 4) $(\sqrt[4]{5})$5

*Directions:*Change the following logs to exponential form.

1. log416 = 2 2. log5 125 = 3 3. log232 = 5 4. log6 1296 = 4

**#4 LITERAL EQUATIONS** *Directions:* Solve for the indicated variable in the parenthesis.

1) P = IRT    *(T)* 2) A = 2(L + W) *(W)* 3) y = 5x - 6 *(x)*

4) 2x - 3y = 8    *(y)* 5) x + y = 5 *(x)* 6) y = mx + b   *(b)*
              3

7) ax + by = c *(y)* 8) A = 1/2h(b + c) *(b)* 9) V = LWH *(L)*

10) A = 4r2    *(r2)* 11) V = r2h  *(h)* 12) 7x - y = 14 *(x)*

13) A = x + y *(y)* 14)  R = E *(I)* 15) x = yz *(z)*

 2 l 6

**#5 RADICAL EXPRESSIONS & EQUATIONS** *Match Up Directions:* Solve the radical equations on the left and match them to their solutions on the right. Use a separate sheet of paper to show all work. When you find a match, color those boxes in using the same color. Some solutions are listed twice. You should use 10 different colors.

|  |  |
| --- | --- |
| 1. 2 = $\sqrt{4b}$
 | {-8} |
| 1. $ \sqrt{n+9}=1$
 | {61} |
| 1. -8 + $\sqrt{5a-5}= -3$
 | {10, -11} |
| 1. 10$\sqrt{9x}=60$
 | {1} |
| 1. $ \sqrt{v+3}-1=7$
 | {6} |
| 1. 90 = 9$\sqrt{25v}$
 | {0, 8} |
| 1. $ \sqrt{3n}= \sqrt{4n-1}$
 | {4} |
| 1. $\sqrt{110-n}$ = n
 | {1, -2} |
| 1. p = $\sqrt{2-p}$
 | {4} |
| 1. x = $\sqrt{8x}$
 | {1} |

**#6 EXPONENTIAL GROWTH & DECAY** *Directions:* Use the exponential growth or decay formulas and compound interest formula to solve the following. Round to the nearest whole number. Be sure to label your answers.

Answers in no particular order (not all will be used): **»2,928,721 »805 »806 »16,234,432 »200 »3,227 »102 »10,443,530 »100 »797 »10,441,162 »795 »1108 »102**

1. States take a census, or a count if its population, every 10 years. The census is used to estimate the population’s growth rate. North Carolina’s population today is 9,943,964 people, and the 10-year growth rate is approximately 10.3%. North Carolina’s population can be estimated at any year *t* using the equation *y = y0 ▪* $(1+r)^{\frac{t}{10}}$, where y0 is the initial population and *r* is the 10-year growth rate. What will be the town’s approximate population in the year 2020?
2. In 1985, there were 28 cell phone users in Charlotte. The number of subscribers increased by 47% per year after 1985. How many cell phone users are there in Charlotte today?
3. You have a headache from all the math you’ve been doing for homework, so you take 400 mg of ibuprofen. Each hour, the amount of ibuprofen in your system decreases by about 29%. How much ibuprofen is left in your body after 4 hours?
4. Find the value, rounded to the nearest whole dollar, of $500 after 8 years, if it is invested at a rate of 6% compounded continuously.
5. Find the value, rounded to the nearest whole dollar, of $500 after 8 years, if it is invested at a rate of 6% compounded quarterly.