**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ #\_\_\_\_\_ Period \_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 2 Study Guide**

1. Given the equation for slope-intercept form y = mx + b, solve for slope (*m*).
2. The perimeter of a rectangle is represented as 2L + 2W = P. Rearrange in terms of the length.
3. You are driving to visit a friend in another state who lives 440 miles away. You are driving 55mph per hour and have already driven 275 miles. Write an equation in terms of time and find how many hours do you have to drive before you reach your destination.
4. Rewrite in exponential form:
	1. $\sqrt[5]{17^{6}}$
	2. $\sqrt[9]{232^{5}}$
	3. $\sqrt[7]{7^{2}}$
5. Rewrite in radical form:
	1. $16^{\frac{2}{5}}$
	2. $408^{\frac{1}{3}}$
	3. $21^{\frac{15}{23}}$
6. Simplify the following radical expressions:
	1. $\sqrt{128}$
	2. $\sqrt{150}$
	3. $\sqrt{567}$
7. Solve the following radical equations for x:
	1. $\sqrt{3n}= \sqrt{4n-1}$
	2. $\sqrt[3]{2x+5}$ – 3 = 0
	3. $\sqrt{7a-54}$ – a = -6
	4. –n + $\sqrt{6n+19}$ = 2
8. Is the following equation sometimes, always, or never true? Explain.
 $x-1=\sqrt{\left(x-1\right)^{2}}$

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ #\_\_\_\_\_ Period \_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 2 Study Guide**

1. Given the equation for slope-intercept form y = mx + b, solve for slope (*m*).
2. The perimeter of a rectangle is represented as 2L + 2W = P. Rearrange in terms of the length.
3. You are driving to visit a friend in another state who lives 440 miles away. You are driving 55mph per hour and have already driven 275 miles. Write an equation in terms of time and find how many hours do you have to drive before you reach your destination.
4. Rewrite in exponential form:
	1. $\sqrt[5]{17^{6}}$
	2. $\sqrt[9]{232^{5}}$
	3. $\sqrt[7]{7^{2}}$
5. Rewrite in radical form:
	1. $16^{\frac{2}{5}}$
	2. $408^{\frac{1}{3}}$
	3. $21^{\frac{15}{23}}$
6. Simplify the following radical expressions:
	1. $\sqrt{128}$
	2. $\sqrt{150}$
	3. $\sqrt{567}$
7. Solve the following radical equations for x:
	1. $\sqrt{3n}= \sqrt{4n-1}$
	2. $\sqrt[3]{2x+5}$ – 3 = 0
	3. $\sqrt{7a-54}$ – a = -6
	4. –n + $\sqrt{6n+19}$ = 2
8. Is the following equation sometimes, always, or never true? Explain.
 $x-1=\sqrt{\left(x-1\right)^{2}}$
9. Two students worked together to simplify the rational expression$ \frac{k^{4}-81}{k^{2}-5k-24}$.
10. Andy reasons that, because there is a factor if k4 in the numerator but a factor of only k2 in the denominator, there is no way to simplify this expression. He says it is already as simple as it can be. Is Andy’s analysis correct? Why or why not?
11. After factoring the numerator, Allen says that the expression is equivalent to $\frac{(k-3)(k^{2}+9)}{k-8}$. Is Allen correct?
12. Solve the following rational equations and find the restrictions:
	1. $\frac{5}{x+3}+ \frac{2}{x^{2}-9}= \frac{4}{x-3}$
	2. $\frac{x+3}{x-2}$ = $\frac{x+4}{x-5}$
	3. $\frac{2}{x}$ = $\frac{x}{5x+12}$
	4. $\frac{5}{2x}- \frac{3}{4x^{2}}= \frac{2}{3x}$
13. 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 12%. 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 2030?
14. Two cars initially cost $20,000. The first car depreciates at a rate of 13% every 2 years. The second car depreciates at a rate of 16% every year. Which car should you purchase if you want the car with the higher value in the future?
15. Two students worked together to simplify the rational expression$ \frac{k^{4}-81}{k^{2}-5k-24}$.
16. Andy reasons that, because there is a factor if k4 in the numerator but a factor of only k2 in the denominator, there is no way to simplify this expression. He says it is already as simple as it can be. Is Andy’s analysis correct? Why or why not?
17. After factoring the numerator, Allen says that the expression is equivalent to $\frac{(k-3)(k^{2}+9)}{k-8}$. Is Allen correct?
18. Solve the following rational equations and find the restrictions:
	1. $\frac{5}{x+3}+ \frac{2}{x^{2}-9}= \frac{4}{x-3}$
	2. $\frac{x+3}{x-2}$ = $\frac{x+4}{x-5}$
	3. $\frac{2}{x}$ = $\frac{x}{5x+12}$
	4. $\frac{5}{2x}- \frac{3}{4x^{2}}= \frac{2}{3x}$
19. 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 12%. 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 2030?
20. Two cars initially cost $20,000. The first car depreciates at a rate of 13% every 2 years. The second car depreciates at a rate of 16% every year. Which car should you purchase if you want the car with the higher value in the future?