

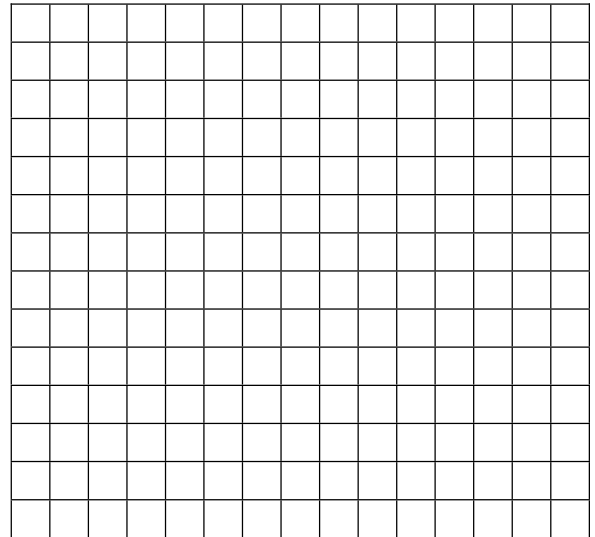
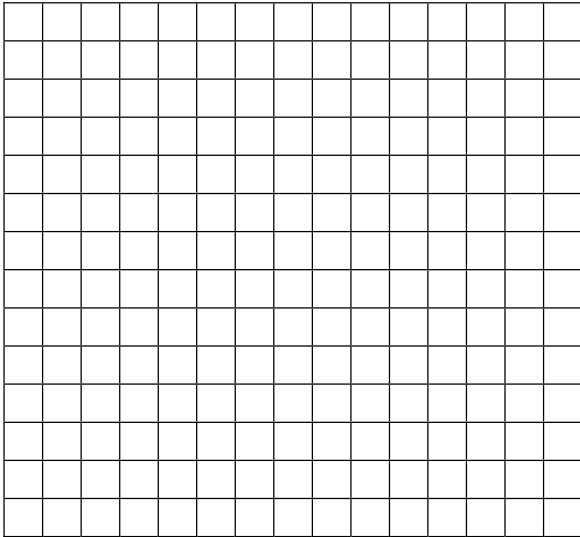
lesson forty six - student resource sheet

Lesson Objective: Graph and apply the formulas for exponential growth, $y = C(1 + r)^t$, and decay, $y = C(1 - r)^t$, to solve real-world problems.

Vocabulary Box

exponential decay – A decreasing quantity that can be shown by the function $y = C(1 - r)^t$, where $C > 0$ and $0 < r < 1$.

exponential growth – An increasing quantity that can be shown by the function $y = C(1 + r)^t$, where $C > 0$ and $r > 0$.





Independent Practice

Please complete the following practice problems on your own. Your teacher will review the answers.

Directions: Answer each question.

1. Write an exponential decay function with a starting amount of 8 and a decay rate of 0.2%.
2. Evaluate this function for $t = 0$, $t = 2$, $t = 5$, $t = 10$, $t = 25$, and $t = 100$. Round to the nearest ten-thousandth, as appropriate.
3. Graph this function.



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4. Write an exponential growth function with a starting amount of 5 and a growth rate of 10%.
5. Evaluate this function for $t = 0$, $t = 1$, $t = 2$, $t = 4$, and $t = 7$. Round to the nearest hundredth, as appropriate.
6. Graph this function.



7. Write an equation for the following situation: "This year, the population of Guildhall is 268. The population is expected to grow at a rate of 1% per year."
8. What will the population of Guildhall be in 5 years? 10 years? 25 years? 50 years? 100 years? Round to the nearest whole person.

9. Write an equation for the following situation: "Little John received 2000 small chocolate candies for his birthday. He decided to eat 5% of his remaining candies each week."

10. How many candies will he have left after 4 weeks? 12 weeks? 26 weeks? 52 weeks?
Round to the nearest whole candy.



Directions: Answer each question.

The half-life of the element Mendelevium is 56 days, which means that it takes 56 days for half of its radioactivity to decay.

A. Write an equation to model this situation for 100 grams of radioactive Mendelevium.

B. About how many grams would remain after 180 days? After 1 year?

C. How many days would it take for the 100 grams to decrease to less than 1 mg?

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Problem Solving

More, Please

Will's boss, Ronald Chump, promised to pay will the greater of two salaries if Will could figure out for which number of paid workdays each salary would be greater.

Let d = the number of days. Find the number of paid workdays that the salary in Column A would be greater and the number of paid workdays that the salary in Column B would be greater.

	Column A	Column B	When A Greater	When B Greater
example	$10d + 200$	$5d + 400$	$d > 40$	$d < 40$
1.	$30d - 600$	$20d$		
2.	$\frac{d}{4} + 1500$	$\frac{d}{2} + 1000$		
3.	$d^2 + 50d + 70$	$d^2 - 25d + 220$		
4.	$100(1.08)^d$	$200(1.05)^d$		



Directions: Answer each question.

1. Write an exponential growth function with a starting point at 400 and a growth rate of 6%.
2. Evaluate the function for $t = 0$, for $t = 1$, for $t = 3$, and for $t = 6$. Round to the nearest tenth, as appropriate.
3. Graph the function.



lesson forty seven - student resource sheet

Lesson Objective: Simplify radical expressions by using the product or quotient property or by rationalizing the denominator.

Vocabulary Box

radical or radical expression – An expression indicating the root of a quantity.

Examples: $\sqrt{5}$ and $\sqrt{x-3}$.

radicand – The quantity under a radical sign. Example: the 3 in $\sqrt{3}$.

rationalize – Remove radicals from an expression.



Guided Practice

You will complete the following practice problems with your partner. Then your teacher will review the answers. Make sure that you show all important work.

Directions: Simplify each expression.

1. $\sqrt{7} \cdot \sqrt{10}$

4. $\frac{9}{\sqrt{6}}$

2. $5\sqrt{28}$

5. $\frac{4}{3-\sqrt{2}}$

3. $6\sqrt{2} \cdot 4\sqrt{7}$



Summary/Closure

A. Vocabulary Words

Directions: Match each term with its definition.

- | | |
|-----------------------|--|
| 1. radical | A. an expression indicating the root of a quantity |
| 2. radical expression | B. a quantity placed under a radical sign |
| 3. radicand | C. remove irrational quantities from |
| 4. rationalize | |

B. Summarize What We Learned Today

Directions: Write three expressions with radicals and simplify them. Then write a few sentences to explain how to simplify expressions with radicals. You will use this explanation as a reference sheet.

lesson forty eight - student resource sheet

Lesson Objective: Simplify radical expressions by using the product or quotient property or by rationalizing the denominator.

Vocabulary Box

radical or radical expression – An expression indicating the root of a quantity.

Examples: $\sqrt{5}$ and $\sqrt{x-3}$.

radicand – The quantity under a radical sign. Example: the 3 in $\sqrt{3}$.

rationalize – Remove radicals from an expression.



Independent Practice

Please complete the following practice problems on your own. Your teacher will review the answers. Make sure that you show all of your work.

Directions: Simplify each expression.

1. $\sqrt{45}$

2. $8\sqrt{8}$

3. $\sqrt{6} \cdot \sqrt{15}$

4. $3\sqrt{7} \cdot 5\sqrt{11}$

5. $\frac{7}{\sqrt{2}}$

6. $\frac{6\sqrt{10}}{\sqrt{3}}$

7. $\frac{12}{4-\sqrt{3}}$

8. $\frac{24}{\sqrt{7}+9}$

BONUS?

Directions: Simplify each expression.

1. $\sqrt{6}(4+\sqrt{2})$

2. $(4-\sqrt{3})(1-\sqrt{2})$

3. $\frac{5+\sqrt{2}}{9-\sqrt{2}}$

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Problem Solving



Directions: Arrange the 12 numbers below into 3 rows of 4 numbers so that the product of each row is equal.

4 10 $2\sqrt{3}$ $2\sqrt{6}$ $2\sqrt{15}$ $3\sqrt{10}$
 $4\sqrt{2}$ $6\sqrt{10}$ $8\sqrt{2}$ $8\sqrt{3}$ $\sqrt{5}$ $\sqrt{6}$



Directions: Simplify each expression.

1. $5\sqrt{8} \cdot \sqrt{6}$

2. $\frac{15}{\sqrt{10}}$

3. $\frac{4}{6 - \sqrt{5}}$