### Lesson 4 Practice Problems

1. A bacteria population is tripling every hour. By what factor does the population change in $\frac{1}{2}$ hour? Select **all** that apply.
	1. $\sqrt{3}$
	2. $\frac{3}{2}$
	3. $\sqrt[3]{2}$
	4. $3^{\frac{1}{2}}$
	5. $3^{2}$
2. A medication has a half-life of 4 hours after it enters the bloodstream. A nurse administers a dose of 225 milligrams to a patient at noon.
	1. Write an expression to represent the amount of medication, in milligrams, in the patient’s body at:
		1. 1 p.m. on the same day
		2. 7 p.m. on the same day
	2. The expression $225⋅\left(\frac{1}{2}\right)^{\frac{5}{2}}$ represents the amount of medicine in the body some time after it is administered. What is that time?
3. The number of employees in a company has been growing exponentially by 10% each year. By what factor does the number of employees change:
	1. Each month?
	2. Every 3 months?
	3. Every 20 months?
4. The value of a truck decreases exponentially since its purchase. The two points on the graph shows the truck’s initial value and its value a decade afterward.
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	1. Express the car’s value, in dollars, as a function of time $d$, in decades, since purchase.
	2. Write an expression to represent the car’s value 4 years after purchase.
	3. By what factor is the value of the car changing each year? Show your reasoning.
1. The value of a stock increases by 8% each year.
	1. Explain why the stock value does not increase by 80% each decade.
	2. Does the value increase by more or less than 80% each decade?
2. Decide if each statement is true or false.
	1. $50^{\frac{1}{2}}=25$
	2. $\sqrt{30}$ is a solution to $y^{2}=30$.
	3. $243^{\frac{1}{3}}$ is equivalent to $\sqrt[3]{243}$.
	4. $\sqrt{20}$ is a solution to $m^{4}=20$.
* (From Unit 4, Lesson 3.)
1. Lin is saving $300 per year in an account that pays 4.5% interest per year, compounded annually. About how much money will she have 20 years after she started?
	1. $545.45
	2. $3,748.78
	3. $9,411.43
	4. $1,124,634.54
* (From Unit 2, Lesson 26.)



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