### Lesson 20 Practice Problems

1. Whenever the input of a function $f$ increases by 1, the output increases by 5. Which of these equations could define $f$?
	1. $f\left(x\right)=3x+5$
	2. $f\left(x\right)=5x+3$
	3. $f\left(x\right)=5^{x}$
	4. $f\left(x\right)=x^{5}$
2. The function $f$ is defined by $f\left(x\right)=2^{x}$. Which of the following statements is true about the values of $f$? Select **all** that apply.
	1. When the input $x$ increases by 1, the value of $f$ increases by 2.
	2. When the input $x$ increases by 1, the value of $f$ increases by a factor of 2.
	3. When the input $x$ increases by 3, the value of $f$ increases by 8.
	4. When the input $x$ increases by 3, the value of $f$ increases by a factor of 8.
	5. When the input $x$ increases by 4, the value of $f$ increases by a factor of 4.
3. The two lines on the coordinate plane are graphs of functions $f$ and $g$.
	1. Use the graph to explain why the value of $f$ increases by 2 each time the input $x$ increases by 1.
	2. Use the graph to explain why the value of $g$ increases by 2 each time the input $x$ increases by 1.
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1. The function $h$ is given by $h\left(x\right)=5^{x}$.
	1. Find the quotient $\frac{h\left(x+2\right)}{h\left(x\right)}$.
	2. What does this tell you about how the value of $h$ changes when the input is increased by 2?
	3. Find the quotient $\frac{h\left(x+3\right)}{h\left(x\right)}$.
	4. What does this tell you about how the value of $h$ changes when the input is increased by 3?
2. For each of the functions $f,g,h,p,$ and $q$, the domain is $0\leq x\leq 100$. For which functions is the average rate of change a good measure of how the function changes for this domain? Select **all** that apply.
	1. $f\left(x\right)=x+2$
	2. $g\left(x\right)=2^{x}$
	3. $h\left(x\right)=111x−23$
	4. $p\left(x\right)=50,​000⋅3^{x}$
	5. $q\left(x\right)=87.5$
* (From Unit 5, Lesson 10.)
1. The average price of a gallon of regular gasoline in 2016 was $2.14. In 2017, the average price was $2.42 a gallon—an increase of 13%.
* At that rate, what will the average price of gasoline be in 2020?
* (From Unit 5, Lesson 16.)
1. A credit card charges a 14% annual nominal interest rate and has a balance of $500.
* If no payments are made and interest is compounded quarterly, which expression could be used to calculate the account balance, in dollars, in 3 years?
	1. $500⋅\left(1+0.14\right)^{3}$
	2. $500⋅\left(1+\frac{0.14}{4}\right)^{3}$
	3. $500⋅\left(1+\frac{0.14}{4}\right)^{12}$
	4. $500⋅\left(1+\frac{0.14}{4}\right)^{48}$
* (From Unit 5, Lesson 17.)
1. Here are equations that define four linear functions. For each function, write a verbal description of what is done to the input to get the output, and then write the inverse function.
	1. $a\left(x\right)=x−4$
	2. $b\left(x\right)=2x−4$
	3. $c\left(x\right)=2\left(x−4\right)$
	4. $d\left(x\right)=\frac{x}{4}$
* (From Unit 4, Lesson 17.)



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