

Model Meaning Match

Read rates, factors, and function values in context.

HIGH SCHOOL • HSF-LE.B

CCSS.Math.Content.HSF-LE.B "Interpret expressions for functions in terms of the situation they model"

NAME _____

DATE _____

READ THE NUMBERS

In a linear model $f(x)=a+bx$, a is the starting amount and b is the amount added or lost for each 1-unit increase in x . In an exponential model $f(x)=a(b)^x$, a is the starting amount and b is the factor that multiplies the output each time x increases by 1. Use the situation's units when you explain a number or expression.

WORKED EXAMPLE

A museum's number of members is modeled by $M(y)=73+8y$, where y is the number of years after the museum opens. Interpret 8.

1. 73 is the constant term, so it is the starting number of members.
2. $8y$ is the part of the model that changes as years pass.
3. The coefficient of y is 8, so each additional year adds 8 members.

Answer: The museum gains 8 members per year.

PRACTICE 6 problems

- 1** A gaming club's prize fund is modeled by $P(k)=264-17k$, where k is the number of weeks and P is dollars. What does -17 mean?

ANSWER _____

- 2** An online post's shares are modeled by $S(h)=7(4)^h$, where h is hours and S is the number of shares in hundreds. What does 4 mean?

ANSWER _____

- 3** A recycling drive models the kilograms left to sort by $R(d)=90(2/3)^d$, where d is days. What does $2/3$ mean?

ANSWER _____

- 4** A fitness app models a user's total points by $T(w)=132+11w$, where w is weeks. What does $T(5)$ represent, and what is its value?

ANSWER _____

- 5** The cost of a custom team-shirt order is $C(t)=14t+65$, where t is the number of shirts and C is dollars. What does $C(9)-C(3)$ represent, and what is its value?

ANSWER _____

- 6** A new song's daily streams are modeled by $N(d)=150(1/5)^d$, where d is days after release and N is streams in thousands. What does $N(d+1)$ mean compared with $N(d)$?

ANSWER _____

APPLY IT Show your work

1

A student club sells hoodies to raise money for a school event. Its profit is modeled by $P(s)=18s-270$, where s is the number of hoodies sold and P is dollars. Explain what 18 and -270 mean. Then find $P(20)$.

WORK SPACE

ANSWER _____

2

After collaborating with another creator, a video creator models followers by $F(w)=640(5/4)^w$, where w is weeks after the collaboration. Explain what 640 and $5/4$ mean. Then find $F(2)$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A student-run merch store models its weekly online orders after a trend ends by $O(w)=432(1/3)^w$, where w is weeks. Explain why $O(w+2)=O(w)/9$, and interpret this equation in context.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A gaming club's prize fund is modeled by $P(k)=264-17k$, where k is the number of weeks and P is dollars. What does -17 mean?	The prize fund decreases by \$17 per week.
2	An online post's shares are modeled by $S(h)=7(4)^h$, where h is hours and S is the number of shares in hundreds. What does 4 mean?	The number of shares is multiplied by 4 each hour.
3	A recycling drive models the kilograms left to sort by $R(d)=90(2/3)^d$, where d is days. What does $2/3$ mean?	Each day, the kilograms left to sort are $2/3$ of the previous day's amount.
4	A fitness app models a user's total points by $T(w)=132+11w$, where w is weeks. What does $T(5)$ represent, and what is its value?	$T(5)$ is the user's total points after 5 weeks, and $T(5)=187$ points.
5	The cost of a custom team-shirt order is $C(t)=14t+65$, where t is the number of shirts and C is dollars. What does $C(9)-C(3)$ represent, and what is its value?	It is the increase in cost for ordering 9 shirts instead of 3 shirts, and $C(9)-C(3)=$84$.
6	A new song's daily streams are modeled by $N(d)=150(1/5)^d$, where d is days after release and N is streams in thousands. What does $N(d+1)$ mean compared with $N(d)$?	$N(d+1)$ is the next day's streams, and it is $1/5$ of $N(d)$.

PART 2 • APPLY IT

- 18 means the club earns \$18 in profit for each hoodie sold. -270 means the club starts with a \$270 cost. $P(20)=$90$.**
Substitute 20 for s : $P(20)=18(20)-270=360-270=90$. The coefficient gives profit per hoodie, and the constant gives the starting cost.
- 640 is the number of followers at the start of the model. $5/4$ means the follower count is multiplied by $5/4$ each week. $F(2)=1,000$ followers.** Calculate $F(2)=640(5/4)^2=640(25/16)=1,000$. The initial value is 640, and the growth factor is $5/4$.

CHALLENGE

$O(w+2)=432(1/3)^{w+2}=432(1/3)^w(1/3)^2=O(w)/9$. This means that 2 weeks later, the store's weekly online orders are $1/9$ of the weekly orders at week w .

Accept equivalent language for rates and factors, such as "quadruples" for "is multiplied by 4." Students should include the correct context and units when interpreting outputs or differences.