LESSON MAKER PRO

Run It Back

Interpret function outputs and inverse outputs.

HIGH SCHOOL · PC.F.2.3

PC.F.2.3 "Interpret the meanings of quantities involving functions and their inverses."

NAME _____ DATE _____

REVERSE THE QUESTION

A function takes an input and gives an output. Its inverse starts with an output and gives the input that produced it. Check the units to tell what each quantity means.

WORKED EXAMPLE

The table shows data used while streaming. Interpret $d^{-1}(17)$.

t (minutes)	d(t) (MB)
2	11
4	17
6	23

1. Find 17 in the d(t) column.
2. Read its matching input: t = 4.
3. The inverse output has units of minutes.

Answer: $d^{-1}(17) = 4$. It takes 4 minutes to use 17 MB.

PRACTICE 4 problems

1 A(t) = 5t + 10 gives arcade points after t games. Interpret A(3).

ANSWER _____

2 C(n) = 9n + 12 gives the cost in dollars of n tickets. Interpret $C^{-1}(39)$.

ANSWER _____

3 H(t) = 85 - 5t gives a phone's battery percent after t hours. Interpret $H^{-1}(60)$.

ANSWER _____

4 V(n) = 18n gives the total minutes in n videos. If V(n) = 90, what does n mean?

ANSWER _____

APPLY IT Show your work

1 A music app records the storage used by downloaded songs. Use the table to interpret $S^{-1}(84)$.

n (songs)	S(n) (MB)
1	28
3	84
5	140

ANSWER _____

2 A game pass costs $14 plus $7 per hour. Let C(h) = 14 + 7h. Interpret C(5) and $C^{-1}(63)$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A bike rental costs B(h) = 8h + 13 dollars for h hours. A coupon takes $8 off, so P(h) = B(h) - 8. Does $B^{-1}(P(9))$ equal 9? Explain with values and units.

WORK SPACE AND ANSWER

ANSWER KEY # Run It Back

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A(t) = 5t + 10 gives arcade points after t games. Interpret A(3).	**A(3) = 25. After 3 games, the player has 25 points.**
2	C(n) = 9n + 12 gives the cost in dollars of n tickets. Interpret $C^{-1}(39)$.	**$C^{-1}(39) = 3$. Three tickets cost $39.**
3	H(t) = 85 - 5t gives a phone's battery percent after t hours. Interpret $H^{-1}(60)$.	**$H^{-1}(60) = 5$. The battery reaches 60% after 5 hours.**
4	V(n) = 18n gives the total minutes in n videos. If V(n) = 90, what does n mean?	**n = 5. Five videos total 90 minutes.**

PART 2 · APPLY IT

1. **$S^{-1}(84) = 3$. Three downloaded songs use 84 MB.** Match 84 MB to its input in the table, 3 songs.
2. **C(5) = 49: five hours cost $49. $C^{-1}(63) = 7$: seven hours cost $63.** Calculate 14 + 7(5) = 49. Solve 14 + 7h = 63 to get h = 7.

CHALLENGE

No. P(9) = $77, and $B^{-1}(77) = 8$ hours. The discounted price for 9 hours equals the regular price for 8 hours.

Accept equivalent interpretations that identify both the quantity and its units. For the challenge, students must distinguish the discounted price from the regular-price function.