LESSON MAKER PRO

Function Face-Off

Compare functions shown in different ways

HIGH SCHOOL · A1P.AF.G.21

A1P.AF.G.21 "Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). Extend from linear to quadratic, exponential, absolute value, and general piecewise."

NAME _____ DATE _____

COMPARE AT THE SAME INPUT

To compare two outputs, use the same input for both functions. Find each output from its rule, table, or graph, then subtract to find the difference.

WORKED EXAMPLE

At x=0, which function has the greater output, and by how much? A(x)=4x+7. Function B is shown in the table.

FUNCTION B

x	B(x)
0	9
1	11

1. A(0)=4(0)+7=7.
2. The table shows B(0)=9. The difference is 9-7=2.

Answer: Function B, by 2.

PRACTICE 4 problems

1 At x=-4, compare A(x)=x^2+6 with B(-4)=18. Which output is greater, and by how much?

ANSWER _____

2 A(x)=|x+5|-14. Function B has a lowest output of -18. Which function has the lower minimum, and by how much?

ANSWER _____

3 A(x)=6·3^x. Function B has pairs (0, 10), (1, 20), and (2, 40). Which output is multiplied by a larger factor each time x increases by 1?

ANSWER _____

4 For x<0, A(x)=x+8 and B(x)=x-6. For x≥0, A(x)=2x+8 and B(x)=2x-6. At x=-5, which output is greater, and by how much?

ANSWER _____

APPLY IT Show your work

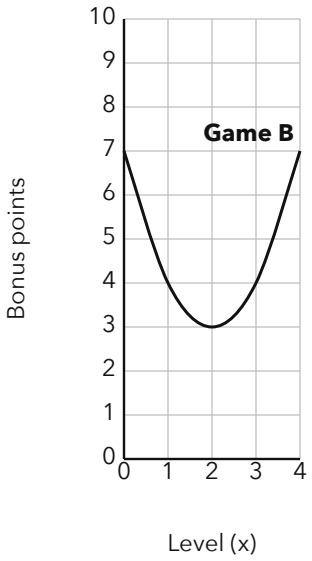
1 Two clips gain views. After x hours, clip A has $A(x)=6x+10$ views. Clip B's views are in the table. At $x=2$, which clip has more views, and how many more?

CLIP B VIEWS

Hours (x)	Views
0	5
1	15
2	45

ANSWER _____

2 Two games award bonus points based on level x. Game A awards $A(x)=(x-2)^2+6$ points. Game B's bonus is graphed. Which game has the lower minimum bonus, and by how much?



ANSWER _____

CHALLENGE One step up

For $x<2$, $A(x)=x+8$. For $x\geq 2$, $A(x)=7x-12$. Function B has output 6 at $x=1$ and output 5 at $x=2$. Compare A and B at both inputs. Does the function with the greater output change?

WORK SPACE AND ANSWER

ANSWER KEY # Function Face-Off

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	At x=-4, compare $A(x)=x^2+6$ with B(-4)=18. Which output is greater, and by how much?	**A, by 4.**
2	A(x)=|x+5|-14. Function B has a lowest output of -18. Which function has the lower minimum, and by how much?	**B, by 4.**
3	$A(x)=6\cdot3^x$. Function B has pairs (0, 10), (1, 20), and (2, 40). Which output is multiplied by a larger factor each time x increases by 1?	**A. Its factor is 3; B's factor is 2.**
4	For x<0, A(x)=x+8 and B(x)=x-6. For x≥0, A(x)=2x+8 and B(x)=2x-6. At x=-5, which output is greater, and by how much?	**A, by 14.**

PART 2 · APPLY IT

1. **Clip B, by 23 views.** A(2)=6(2)+10=22 views. The table shows 45 for B, and 45-22=23.
2. **Game B, by 3 points.** A(x) has a minimum of 6 at x=2. The graph shows B's minimum is 3, so the difference is 3 points.

CHALLENGE

At x=1, A=9 and B=6, so A is greater. At x=2, A=2 and B=5, so B is greater. Yes, it changes.

Accept comparisons stated in words or with inequalities. In the challenge, students must use the x≥2 rule when x=2.