Inside Out Checks

Does the composition equal the stated value?

8A.AF.F.19.b "Use function composition to combine different types of standard functions to write and evaluate functions."

NAME _____ DATE _____

TRUE

Apply the inside function first, then the outside function. The result matches the stated value.

If u(t)=|t| and v(t)=t+11, then u(v(-17))=6.

FALSE

Apply the inside function first, then the outside function. The result does not match the stated value.

If u(t)=|t| and v(t)=t+11, then u(v(-19))=-8.

1 SORT

8 items

Let f(x)=x² and g(x)=3x-2; in Part 1, circle TRUE or FALSE for each statement, and in Part 2, choose two items and explain how you knew.

1. f(g(0))=4 TRUE FALSE

2. g(f(2))=10 TRUE FALSE

3. f(g(-1))=1 TRUE FALSE

4. g(f(0))=-2 TRUE FALSE

5. g(f(-3))=-29 TRUE FALSE

6. f(g(1))=-1 TRUE FALSE

7. f(g(3))=49 TRUE FALSE

8. g(f(-1))=1 TRUE FALSE

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write two new statements using f and g, one TRUE and one FALSE; include a value for each composition.

TRUE _____

FALSE _____

CHALLENGE

Evaluate $(f \circ g \circ f)(-2)$, showing the result of each function in order.

ANSWER KEY

Inside Out Checks

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	f(g(0))=4	**TRUE**	g(0)=-2, and f(-2)=4.
2	g(f(2))=10	**TRUE**	f(2)=4, and g(4)=10.
3	f(g(-1))=1	**FALSE**	g(-1)=-5, and f(-5)=25.
4	g(f(0))=-2	**TRUE**	f(0)=0, and g(0)=-2.
5	g(f(-3))=-29	**FALSE**	f(-3)=9, and g(9)=25.
6	f(g(1))=-1	**FALSE**	g(1)=1, and f(1)=1.
7	f(g(3))=49	**TRUE**	g(3)=7, and f(7)=49.
8	g(f(-1))=1	**TRUE**	f(-1)=1, and g(1)=1.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **TRUE**: f(g(5))=169
- **FALSE**: g(f(4))=40

Challenge: f(-2)=4; g(4)=10; f(10)=100, so $(f \circ g \circ f)(-2)=100$.

For Part 2, a student could explain item 1 with g(0)=-2 and f(-2)=4. For item 3, g(-1)=-5 and f(-5)=25, not 1.