Warm-Up

- 1. Identify the vertical and horizontal asymptote: $\frac{5}{x-3} + 7$ V.A. x = 3 H.A. y = 7
- 2. Identify the domain and range: $\sqrt{x-7}$ D. $[7, \infty)$ R. $[0, \infty)$
- 3. Write the equation when the parent function $f(x) = x^3$ has a horizontal translation right 3 and reflects across the x-axis $f(x) = -(x-3)^3$
- 4. Evaluate and Graph the piecewise function: $f(x) = \begin{cases} 2x , x \le 5 \\ 2 , x > 5 \end{cases}$
 - f(6)
- f(5) し
- f(10)

Review:

1. Identify the transformation: $f(x) = -.5(x - 3)^2 + 7$

ACT Question of the Day

6. Jorge's current hourly wage for working at Denti Smiles is \$12.00. Jorge was told that at the beginning of next month, his new hourly wage will be an increase of 6% of his current hourly wage. What will be Jorge's new hourly wage?

$$f(x) = \begin{cases} 2x + 4 & , & x < 3 \\ 5 & , & 3 \le x \le 5 \\ 3x & , & x > 5 \end{cases}$$

7. evaluate: f(-2)

Unit 1: Functions Function Compositions

Example 1:

$$f(x) = x + 3$$

$$q(x) = 2x$$

evaluate f(3):

$$\chi = 3$$

$$f(3) = 3 + 3$$

 $f(3) = 6$

A composition of a function is when one function is inside of another.

The notation used for the composition of function looks like

this $(f \circ q)(x)$: the composition of the function f with q is defined as follows - $(f \circ q)(x) = f(g(x))$.

What do you notice about the function?

$$(f \circ g)(x) = f(g(x))$$

 $g(x)$ is inside $f(x)$

$$f(x) = x + 4 \qquad g(x) = 3x$$

evaluate
$$f(5) + (5) = 5 + 4 = 9$$

evaluate
$$2f(5)$$

$$18$$

$$f(1) = | +4$$

$$f(1) = 5$$

$$g(5) = 3(5)$$
evaluate $g(f(1))$

$$g(5) = 15$$

$$f(x) = 3x + 1 \qquad g(x) = 2x$$

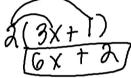
evaluate
$$(f \circ g)(x)$$

 $f(g(x))$
 $f(Ax) = Ax$
 $3(Ax) + 1$
 $3(Ax) + 1$

example 4: evaluate
$$(g \circ f)(x)$$

1. $g(f(x))$
 $g(3x+1) \times = 3x + 1$





Black History Fact of the day

"Lift Every Voice and Sing" — often referred to as the "Black American National Anthem"— is a song written as a poem by <u>James Weldon Johnson</u> (1871–1938) in 1899 and set to music by his brother <u>John Rosamond Johnson</u> (1873–1954) in 1905. It is one of the authorized hymns in the <u>Episcopal</u> hymnal.

"Lift Every Voice and Sing" was publicly performed first as a poem as part of a celebration of <u>Abraham Lincoln</u>'s <u>birthday</u> on February 12, 1900, by 500 school children at the segregated <u>Stanton School</u> in <u>Jacksonville</u>, <u>Florida</u>. Its principal, <u>James Weldon Johnson</u>, wrote the words to introduce its honored guest <u>Booker T</u>, <u>Washington</u>. The poem was set to music soon after by Johnson's brother John in 1905. In 1919, the <u>National Association for the Advancement of Colored People</u> (NAACP) dubbed it "The Negro National Anthem" for its power in voicing the cry for liberation and affirmation for African-American people.

In 1939, <u>Augusta Savage</u> received a <u>commission</u> from the <u>New York World's Fair</u> and created a 16-foot plaster sculpture called *Lift Every Voice and Sing* which was destroyed by bulldozers at the close of the fair.

example 5: Your Turn $f(x) = x - 3 \qquad g(x) = x^{3}$ evaluate $(f \circ g)(x)$ f(g(x)) $f(x^{3}) \quad x = x^{3}$ example 6: evaluate g(f(x))

example 6: evaluate
$$g(f(x))$$

 $g(x-3)$
 $x=x-3$
 $g(x)=(x)^3$
 $=(x-3)^3$