Name: _____ **Answer Key** Date: _____

FUNCTION NOTATION
COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. Without using your calculator, evaluate each of the following given the function definitions and input values.

(a) $f(x) = 3x + 7$ (b) $g(x) = 3x^2$ (c) $h(x) = \sqrt{x-5}$

$f(-4) =$ **$3(-4)+7 = -12+7 = -5$** $g(2) =$ **$3(2)^2 = 3(4) = 12$** $h(41) =$ **$\sqrt{41-5} = \sqrt{36} = 6$**

$f(2) =$ **$3(2)+7 = 6+7 = 13$** $g(-3) =$ **$3(-3)^2 = 3(9) = 27$** $h(14) =$ **$\sqrt{14-5} = \sqrt{9} = 3$**

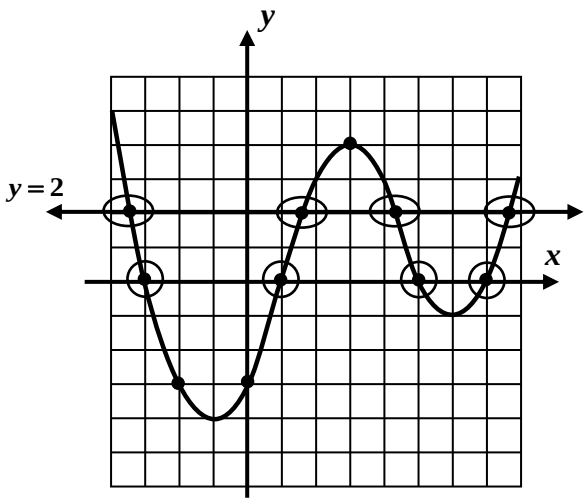
2. Using **STORE** on your calculator, evaluate each of the following more complex functions.

(a) $f(x) = \dfrac{3x^2 - 5}{4x + 10}$ (b) $g(x) = \dfrac{\sqrt{25 - x^2}}{x}$ (c) $h(x) = 30(1.2)^x$

$f(-5) =$ **-7** $g(4) =$ **0.75 or $\frac{3}{4}$** $h(3) =$ **51.84**

$f(0) =$ **-0.5 or $-\frac{1}{2}$** $g(-3) =$ **$-1.\overline{3}$ or $-\frac{4}{3}$** $h(0) =$ **30**

3. Based on the graph of the function $y = g(x)$ shown below, answer the following questions.



(a) Evaluate $g(-2), g(0), g(3)$ and $g(7)$.

$g(-2) = -3$
$g(0) = -3$
$g(3) = 4$
$g(7) = 0$

(b) What values of *x* solve the equation $g(x) = 0$

$\{-3, 1, 5, 7\}$ Shown circled on the graph.

(c) Graph the horizontal line $y = 2$ on the grid above and label.

(d) How many values of *x* solve the equation $g(x) = 2$?

There are four solutions to this equation. They would be the *x*-coordinates of the intersection points enclosed in the diagram above using ovals/ellipses.

APPLICATIONS

4. Ian invested \$2500 in an investment vehicle that is guaranteed to earn 4% interest compounded yearly. The amount of money, *A*, in his account as a function of the number of years, *t*, since creating the account is given by the equation $A(t) = 2500(1.04)^t$.

(a) Evaluate $A(0)$ and $A(10)$.

$A(0) = 2500(1.04)^0 = 2500$

$A(10) = 2500(1.04)^{10} = 3700.61$

(b) What do the two values that you found in part (a) represent?

$A(0)$ represents the initial amount invested

$A(10)$ represents the amount after 10 years

(c) Using tables on your calculator, determine, to the nearest whole year, the value of *t* that solves the equation $A(t) = 5000$. Justify your answer with numerical evidence.

x	*y*
17.5	4966.2
17.6	4985.7
17.7	5005.3
17.8	5025.0

18 years

(d) What does the value of *t* that you found in part (b) represent about Ian's investment?

This indicates that it takes approximately 18 years for Ian's investment to double in value.

5. A ball is shot from an air-cannon at an angle of 45° with the horizon. It travels along a path given by the equation $h(d) = -\frac{1}{50}d^2 + d$, where *h* represents the ball's height above the ground and *d* represents the distance the ball has traveled horizontally. Using your calculator to generate a table of values, graph this function for all values of *d* on the interval $0 \le d \le 50$. Look at the table to properly scale the *y*-axis.

What is the maximum height that the ball reaches? At what value of *d* does it reach this height?

The maximum height is 12.5 which is reached at a *d* value of 25.