Name: _____

Block: _____

Algebra 2H: Relations, Functions, Graphs
Review for test

Review chapter 3 in the book.

Make sure you are familiar with all the material in the review sheet (given here as small image).

Terms: Chapter 3. Relations, functions, and graphs
(Focus on linear equations and straight-lines)

Relation: Ordered pair
        Domain: All possible input values
        Range: All possible output values

Function: A relation with one output for each input
Vertical line test

Linear equations (straight lines):
1. No product of variables.
2. No variable has a power greater than 1.
3. No variable in the denominator.

Slope:

$$m = \frac{\text{rise}}{\text{run}} = \frac{(y_2 - y_1)}{(x_2 - x_1)}$$

Horizontal line slope: 0
Vertical line slope: undefined

Slope-intercept form	$y = mx + b$	m is slope b is y-intercept
Point-slope form	$(y - y_1) = m \cdot (x - x_1)$	m is slope Line contains point (x_1, y_1)
Two points form	$(y - y_1) = \left(\frac{y_2 - y_1}{x_2 - x_1}\right) \cdot (x - x_1)$	Line contains point (x_1, y_1) and (x_2, y_2)
Standard form	$Ax + By + C = 0$	Slope is $m = -\frac{A}{B}$, if $B \neq 0$

Parallel lines: Equal slope: $m_2 = m_1$, different intercept
Perpendicular lines: $m_2 = -\frac{1}{m_1}$

More on functions

One-to-One function: One input for each valid output
Horizontal line test

Function composition: f(g(x)) ; $(f \circ g)(x)$

Algebra 2H: Relations, Functions, Graphs
PRACTICE test

There are **20 questions** in this test, each worth **2pts** .
There are **2 additional** extra-credit questions, each worth **1pt**.
You have **30 minutes** to complete the test (more if you have accommodations).

=== Start of test

For each of the following, choose the most specific name from "Relation", "Function", or "1-to-1 function":

1)   (Monday, Block2)   , (Monday, Block3) , (Monday, Block1) , (Monday, Block4)

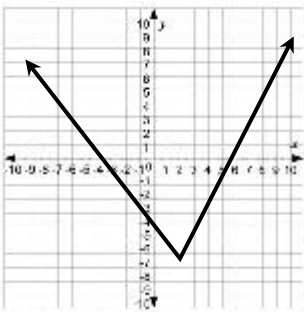   a) Relation   b) Function   c) 1-to-1 function

2)   (Block2,Monday)   , (Block2, Tuesday) , (Block2, Thursday)

   a) Relation   b) Function   c) 1-to-1 function

3)   (CS, Block2) , (APUSH,Block3)   , (Geometry, Block4)

   a) Relation   b) Function   c) 1-to-1 function

4)

       a) Relation   b) Function   c) 1-to-1 function

===

===

Find the equation for the following lines:

5) With slope = 4 and x-intercept=3. Give your result in slope-intercept form.

6) With slope = 4 and y-intercept=3. Give your result in slope-intercept form.

7) Through (3,1) and (5,7). Give your result in slope-intercept form.

8) Find the slope and y-intercept of a line with equation 6x+2y=24.

9) Parallel to the line $y = \frac{x}{4} + 2$, and containing the point (2,4). Give your result in slope-intercept form.

10) Perpendicular to the line $y = 2 - x$, and having y-intercept 5. Give your result in slope-intercept form.

11) Write in standard form the equation $5y = \frac{2}{3}x + 1$

12) Is the following equation linear $(y - 3x) \cdot (3x - y) = 3x - 3y + 1$?

13) What is the slope of the line going through the points $(3, -1)$ and $(1, -3)$?

14) What is the slope of the line given by $5x - 2y + 9 = 27$?

===
Given the following definitions:
$$f(x) = \frac{x}{2} - 1 \quad , \quad g(x) = x \cdot x + 2 \quad , \quad h(x) = |x - 5|$$

Find the following:

15) $f(6)$

16) $g\left(\frac{1}{2}\right)$

17) $f(f(g(2)))$

18) $h(-1)$

19) $f(4x + 2)$

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

===

Extra-credit

21) In the practice you have only one, below, to try and stretch your understanding.

22) A square has two of its adjacent corners at coordinates (0,2) and (5,0). The sides of the square have slopes denoted as m_1, m_2, m_3, m_4.
What is the value of the product $(m_1 \cdot m_2 \cdot m_3 \cdot m_4)$?

=== End of test