

Name: _____

Block: _____

**Algebra 2H: Relations, Functions, Graphs
Group A**



There are **20 questions** in this test, each worth **2pts**.

There are **2 additional** extra-credit questions, each worth **1pt**.

You have **45 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) (2,4) (6,8) (-1,4) (0,0)

a) Relation

b) Function

c) 1-to-1 function

2) (-1,2) (2,-1) (-3,4) (4,-3)

a) Relation

b) Function

c) 1-to-1 function

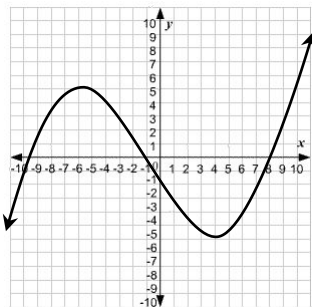
3) (4,2) (1,3) (4,6) (1,1)

a) Relation

b) Function

c) 1-to-1 function

4)



a) Relation

b) Function

c) 1-to-1 function

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Find the equation for the following lines:

5) With slope = -2 and y-intercept = 1. Give your result in slope-intercept form.

6) Through (3,-2) with slope = 2. Give your result in slope-intercept form.

7) Through (2,1) and (1,-2). Give your result in slope-intercept form.

8) Perpendicular to the line $y = 4x + 2$, and having x-intercept 5. Give your result in slope-intercept form.

9) Parallel to the line $y = 5x + 6$, and containing the point (1,3). Give your result in slope-intercept form.

10) Perpendicular to the line $y = 2 - \frac{1}{2}x$, and having y-intercept 5. Give your result in slope-intercept form.

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

12) What is the slope of the line going through the points $(3,0)$ and $(-1,0)$?

13) What is the slope of the line given by $(2y - 3) = 5 - 3x$?

14) During the summer, I wanted to try a new Gym. The Gym had two plans:

a. Plan **I**: Registration fee of \$100. Then, \$50 for each month.

b. Plan **II**: Drop in rate of \$12 per visit.

Explain (preferably with numbers) your answers to the below:

1. If I plan to visit 4 times a month, for three months, which plan should I use?

2. If I plan to visit 8 times a month, for three months, which plan should I use?

3. Over how many visits a month, for three months, would plan **I** be better?

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Given the following definitions:

$$f(x) = 2x + 5 \quad , \quad g(x) = x^2 - 3 \quad , \quad h(x) = |7 - x|$$

Find the following:

15) $f(3)$

16) $g(-1)$

17) $f(g(g(h(8))))$

18) $h(-7)$

19) $h(3x + 2)$

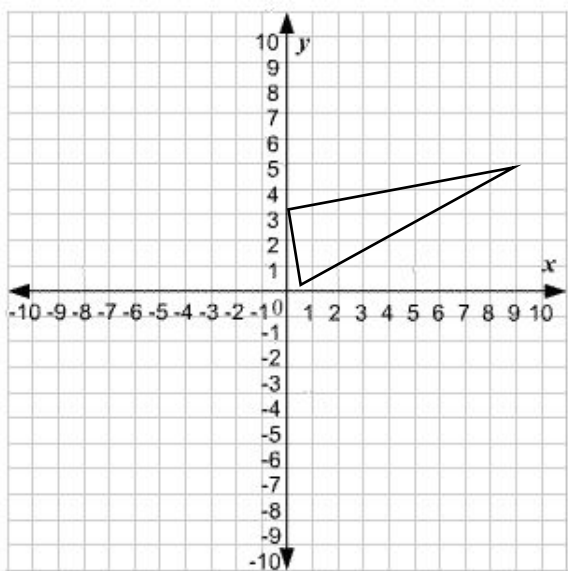
20) $(h \circ f)(x)$

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Extra-credit

21) Two lines are perpendicular, and neither is vertical. How many quadrants must the lines pass through? Explain.

22) The picture below describes a right triangle. The 3 sides have slopes denoted as m_1, m_2, m_3 . What can you say about the value of the product $(m_1 \cdot m_2 \cdot m_3)$? See 4 options below. Explain your answer.



- a) $-\infty < (m_1 \cdot m_2 \cdot m_3) \leq -1$
- b) $-1 \leq (m_1 \cdot m_2 \cdot m_3) \leq 0$
- c) $0 \leq (m_1 \cdot m_2 \cdot m_3) \leq 1$
- d) $1 \leq (m_1 \cdot m_2 \cdot m_3) < \infty$

=== End of test