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

 Practice

**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) $\left(2,4\right) \left(6,8\right) \left(-1,4\right) (0,0)$

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

2) $\left(-1,2\right) \left(2,-1\right) \left(-3,4\right) (4,-3)$

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

3) $\left(4,2\right) \left(1,3\right) \left(4,6\right) (1,1)$

 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 $\left(3-y\right)⋅\frac{1}{2}=5-\left(3x+2\right)⋅\frac{1}{2}$

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 $\left(2y-3\right)=5-3x$ ?

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:

$f\left(x\right)= 2x+5$ , $g\left(x\right)= x^{2}-3$ , $ h\left(x\right)=\left|7-x\right|$

Find the following:

15) $f\left(3\right)$

16) $g\left(-1\right)$

17) $f\left(g(g\left(h\left(8\right)\right)\right)$

18) $h\left(-7\right)$

19) $h\left(3x+2\right)$

20) $(h∘f)(x)$

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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 $(m\_{1}⋅ m\_{2}⋅m\_{3})$ ? See 4 options below. Explain your answer.



1. $-\infty <(m\_{1}⋅ m\_{2}⋅m\_{3})\leq -1$
2. $-1\leq (m\_{1}⋅ m\_{2}⋅m\_{3})\leq 0$
3. $0\leq (m\_{1}⋅ m\_{2}⋅m\_{3})\leq 1$
4. $1\leq (m\_{1}⋅ m\_{2}⋅m\_{3})<\infty $

=== End of test