Jakarta International School

8th Grade – AG1

Practice Test - Blue

Unit 2: Graphing

Name:
_____

Date:
_____

Score: $\frac{\quad}{70}$

Goal 4:   Students convert graphical, symbolic, and numerical representations of data

1. The points (-2,-3), (2,-6), and (5,-2) are three vertices of a square.

    a. What are the coordinates of the fourth vertex?

   (1 pt)

    b. Find the square's side length?

    (1 pt)

2. What can be determined about the signs of x and y if (x,y) lies…

    a) in the second quadrant? (1 pt)

    b) below the origin on the y-axis? (1 pt)

3. The line through the points (-5, 1) and (-1, 3) passes through every quadrant except one. Which one? (1 pt)

4. A point is randomly selected from within the rectangle having vertices (-1,0), (1,0), (-1,2), and (1,2). What's the probability that the x-coordinate will be less than a half of the y-coordinate? (2 pts)
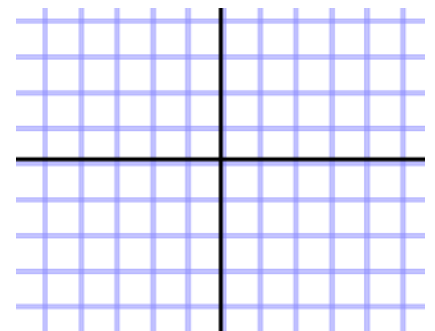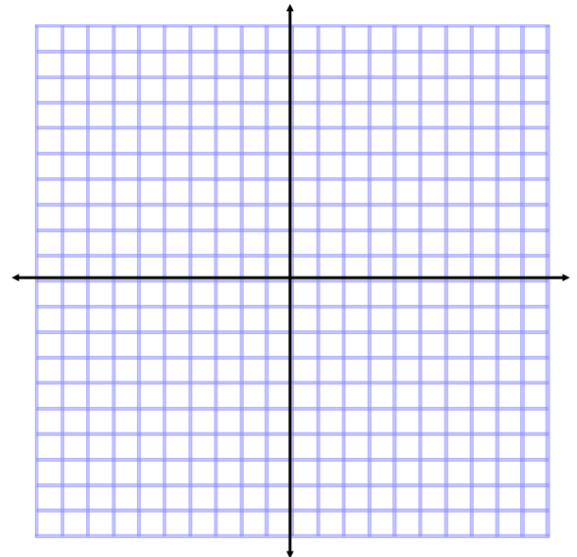
5. You are the student manager of your high school soccer team. You are working on the team's program guide and have recorded the height and weight of the team's eleven players.

Height (in.)	72	70	71	70	69	70	69	73	66	70	76
Weight (pounds)	190	170	180	175	160	160	150	180	150	150	200

a. Make a scatter plot of the data. Put height h on the horizontal axis and weight w on the vertical axis. (2 pts)
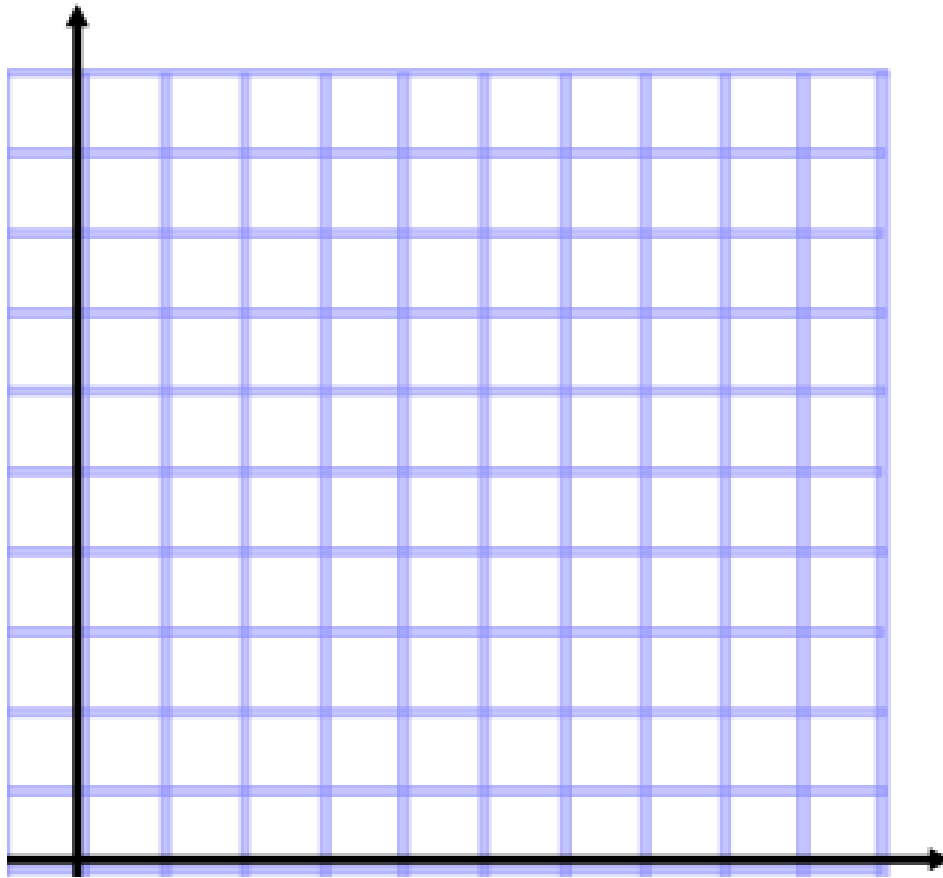
b. Use a line of best fit to estimate the weight of a player who is 74 inches tall. (2 pts)

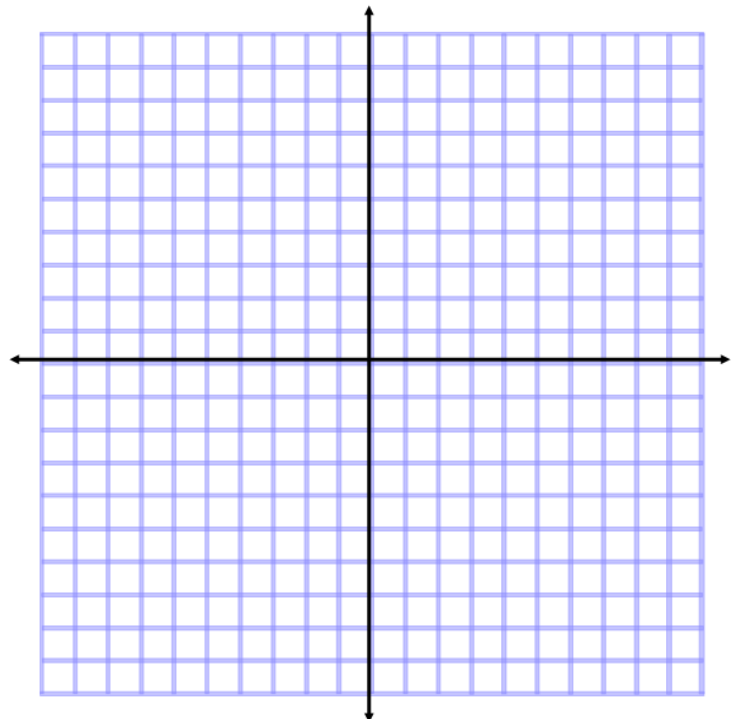c. Describe the relationship between the heights and weights of the team's members? (1 pt)

6. Two lines defined by the equations $y = mx - 5$ and $y = 2x + b$, where m and b are constants, intersect at the point (3,1). What is the value of $b + m$? (1 pt)

7. Use a table of values to graph the equations mentioned in the following problem. Then, answer the question.

   What is the number of square units in the area of the region bounded by the graphs of $y = 2|x|$ and $y = -2|x| + 4$ (3)
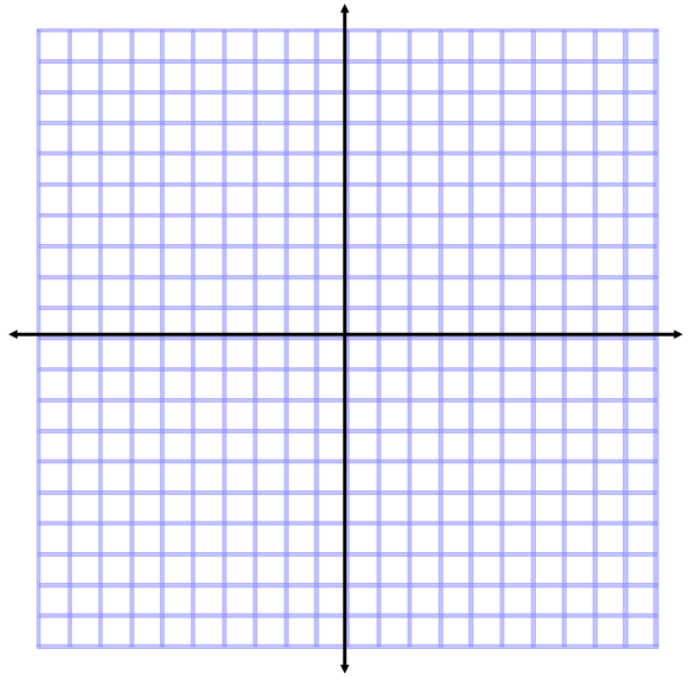
8. Use a table of values to graph the following function: $y = \dfrac{1}{2}^x$ (2 pts)
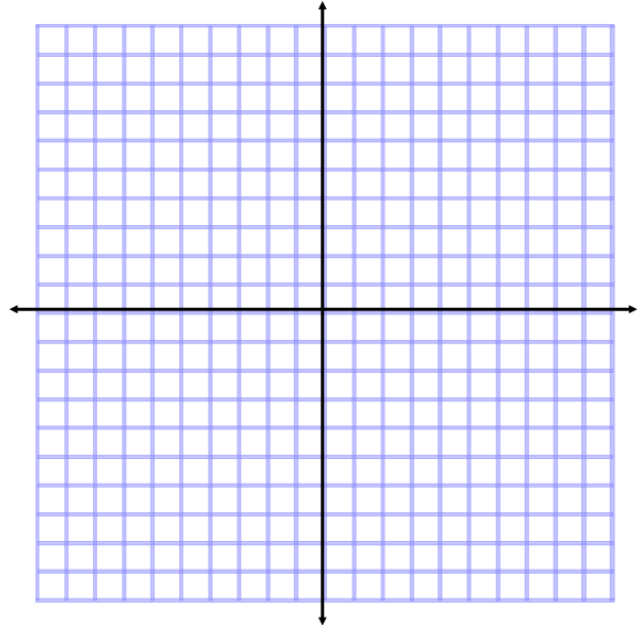
9. On the planet of Creon, every creature is exactly the same height (80 cm), but no creature is the same weight. The heaviest creature is 100 kg.

a. Graph the relationship between x, the height of each creature, and y, each creature's weight. (1 pt)

b. Write an equation for this graph? (1 pt)

c. What is the Domain of this graph? Range? (2 pts)

10. Two vertices of a triangle are located (-4,-2) and (2,-2). If the area of the triangle is 15 square units, what are all the possible positions for the third vertex? (2 pts)

11. If (-2,0) and (1,s) are two points on a line with a negative slope, what can you say about s? (2 pts)

12. If a coordinate plane were placed on top of the map of Math City, Algebra Lane would go through the points (0, 0) and (5, 2). Geometry Boulevard runs perpendicular to Algebra Lane and passes through the points (0, 5) and (-2, y). Find the value of y algebraically? (2)

13. Steve is making crafts to sell at a fair. It takes him $\frac{2}{3}$ of an hour to make a wooden fork and $\frac{1}{2}$ hour to make a wooden spoon. He has 6 hours to work.

A. Write an equation to show the relationship between how many forks and spoons Steve can make in three hours. Let x = the number of forks and y = the number of spoons. (2)

B. Graph your equation from Part A. (2)

C. What is the x-intercept? What does it represent in this situation? (1)
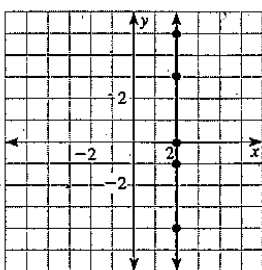
D. What is the y-intercept? What does it represent in this situation? (1)

E. If Steve works the entire 6 hours while making 8 spoons, how many forks did he make? (1)
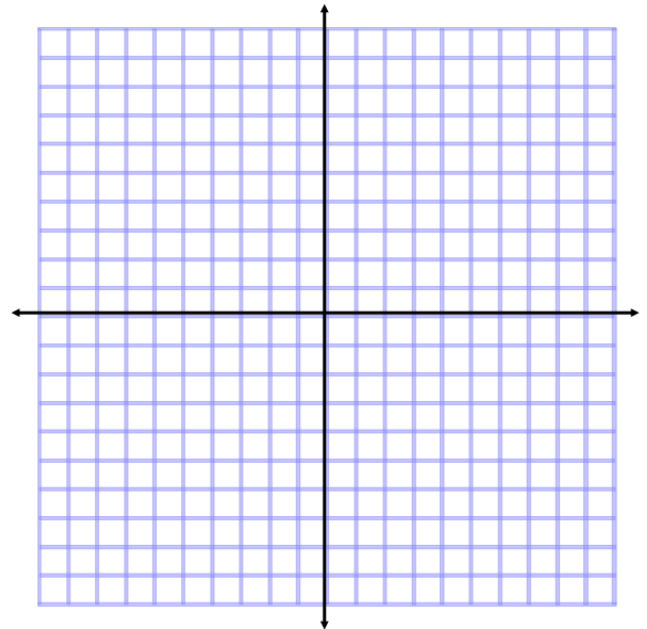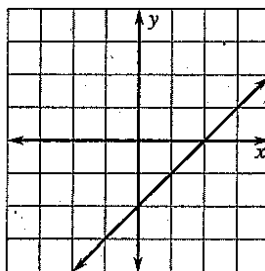
14. What is the slope of each line pictured below? (2 pts total)
   a.   b.

15. Weight varies directly with gravity. A person who weighs 150 pounds on Earth weighs 57 pounds on Mars.

   a. Write an equation that relates a person's weight, E, on Earth to that person's weight, M, on Mars. (1 pt)

   b. A person weighs 210 pounds on Earth. Estimate that person's weight on Mars. (1 pt)

16. Blackbeard was standing at a point 5 steps East and 2 steps North of a booby trap, with a long rope in his hand. Holding one end in his hand, he gave the other end to one of his men and directed him to walk 6 steps south and 8 steps east. He gave another rope to each of two other men, instructing one to walk to a spot 6 steps due east and 2 steps due north of his position. He told the third man to walk to a spot that was 6 steps due south and 2 steps due west. Blackbeard decided to bury a treasure at the point where the two ropes crossed. Determine the exact coordinates of that "x" spot **using algebra.**   (3 pts)
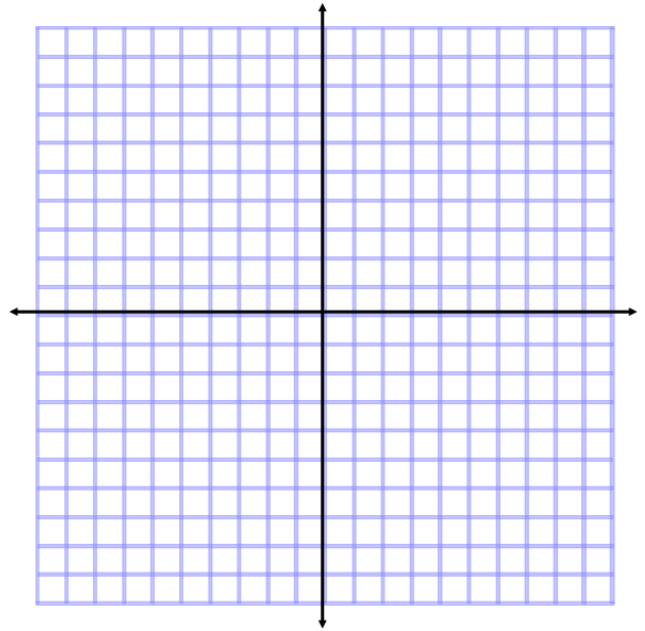
17. For each of the following equations,

a. $-x+2y=6$ b. $-x+2y=-2$ c. $x+2y=4$ d. $-2x+y=8$

A. Identify the slope and y-intercept of each equation's graph   (4 pts total: ½ point per box)

		Slope	Y-Intercept
a	$-x+2y=6$		
b	$-x+2y=-2$		
c	$x+2y=4$		
d	$-2x+y=8$		

B. Graph and label each line on the axes shown. (4 pts)

C. Which 2 equations represent parallel lines? (1 pt)

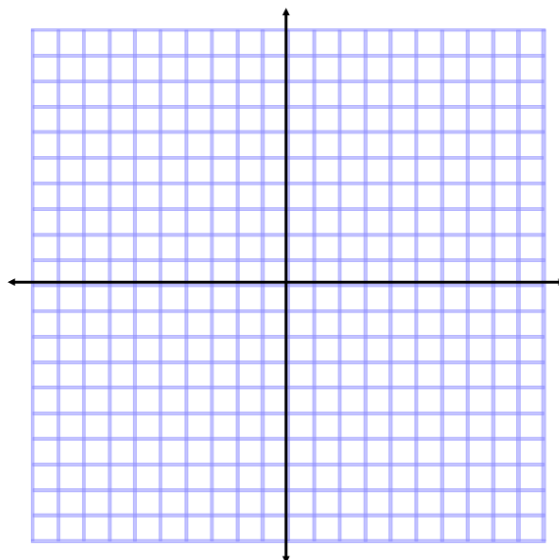D. Which 2 equations represent perpendicular lines? (1 pt)

E. How can you tell which lines will be parallel and perpendicular just by looking at the equations in slope intercept form? Explain. (2 pts)
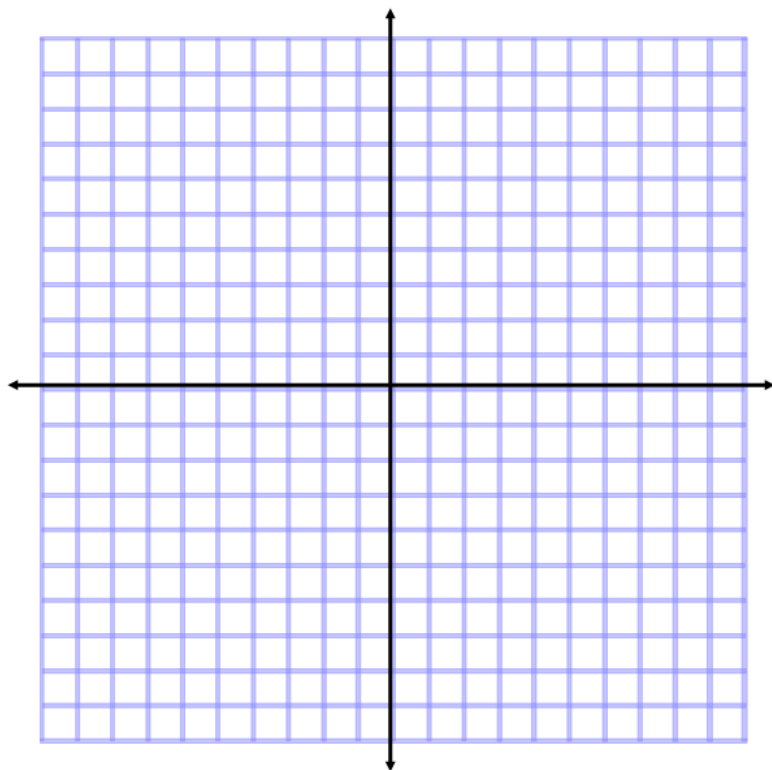
18. Write an equation of a line through (4,5) that is perpendicular to $y = \frac{1}{2}x + 3$ (2 pts)

19. Graph the following equation: (2 pts)

$$y - 3 = \frac{2}{3}(x+1)$$

20. **Capture the Flag!** The English and History classes at Mathland High School are planning to play a game of Capture the Flag in the woods behind the school. They've been discussing how to fairly divide the woods into two territories, as the game requires. To help, they've drawn a map of the woods on a coordinate plane. The English class wants to claim the southwest territory of the woods and puts their base at (-10,-4). The History class wants to claim the northeast territory, and plans to put their base at (-3,8). Both classes agree that the perpendicular bisector of the segment joining their bases would be a fair divider between the two territories. What is the equation of that line in slope-intercept form? (3 pts)
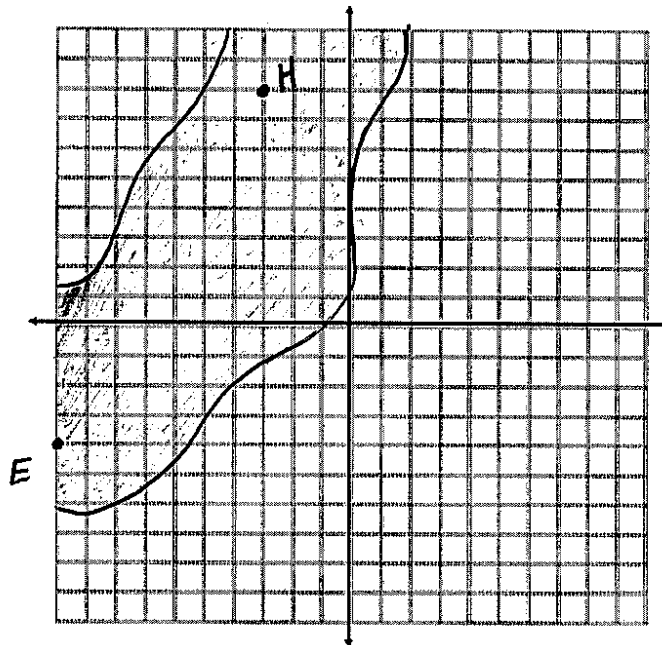
21. **Temperature Affects Running Speed**: The optimal running speed at 60^0F is 17.6 feet per second. A person would slow down by about .3 foot per second for every 5^0 increase in temperature above 60^0F.

    A. Write an equation that represents this situation in point-slope form. (1 pt)

    B. Now, write the equation in slope-intercept form. (1 pt)
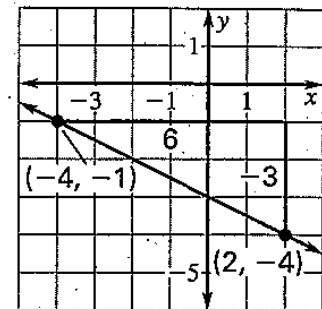
    C. What is the optimal running speed if the outside temperature is 80^0F? (1 pt)

22. In point-slope form, write an equation of the line that passes through the given points:

(2w,-z) and (w,w-z)   (1 pt)

B. Now, write the equation in slope intercept form.   (1 pt)

23. Write an equation of the line in point slope form (2 pts)

B. Now, write the equation in slope-intercept form.   (1 pt)

24. You have $12 to spend on fruit for a meeting. Grapes cost $1 per pound and peaches cost $1.50 per pound. Let x represent the number of pounds of grapes you can buy. Let y represent the number of pounds of peaches you can buy. Write and graph an inequality to model the amounts of grapes and peaches you can buy.
(1 pt)