Name _____

Work for entering Honors Geometry or Integrated Geometry

Summer Work 2023

Show all work (when appropriate). Identify final answers clearly. You may write on this packet or a separate sheet of paper. Simplification is implied for all problems. Leave answers in fractional form when appropriate (improper fractions are preferred to mixed numbers). Problems are to be returned on the first Friday of classes (which is NOT the first day of school). A test reviewing the prerequisite skills (reviewed in this packet) will be conducted the following week of classes.

NO CALCULATORS ALLOWED

PART 1: Linear Equations and Inequalities

1 – 10: Solve the equation

1. $2(x-5)=14$

2. $4.2x+6.4=40$

3. $(3x+2)-2(x+4)=7$

4. $\frac{2}{3}x+5=21$

5. $\frac{2}{3}=\frac{x}{18}$

6. $\frac{x+1}{5}=\frac{4x}{15}$

7. $\frac{8+x}{2}=10$

8. $\frac{3}{y+2}=\frac{2}{y}$

9. $x+2x+(2x+15)=180$

10. $104=\frac{1}{2}[(360-x)-x]$

11 – 13: Solve the inequalities

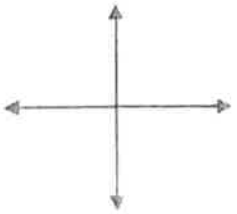
11. $8(x-3) \geq 96$

12. $3-x<-2$

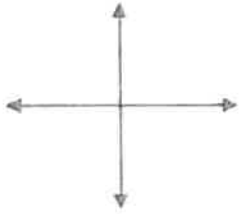
13. $2-10x \geq 22$

PART 2: Graphing Linear Equations

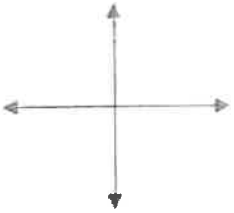
14. Sketch a line with the appropriate slope.



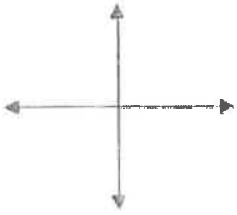
Positive



Negative



Zero

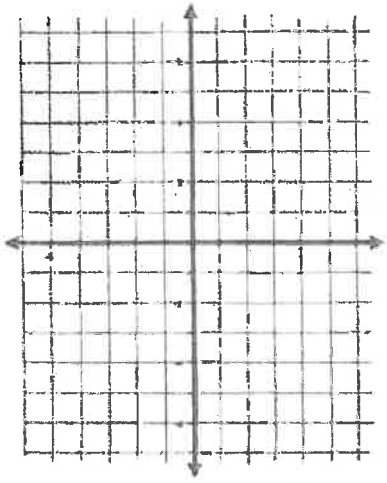


Undefined

15 – 16: Plot and label the points. Draw the line that passes between them. Calculate the slope using the slope formula.

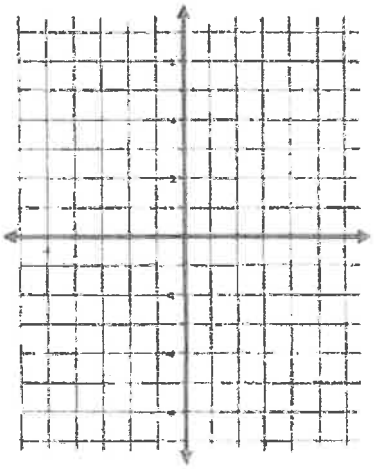
The slope of the line between $A(x_1, y_1)$ and $B(x_2, y_2)$ is: $m = \frac{y_2 - y_1}{x_2 - x_1}$

15. A(0,3) and B(6,1)



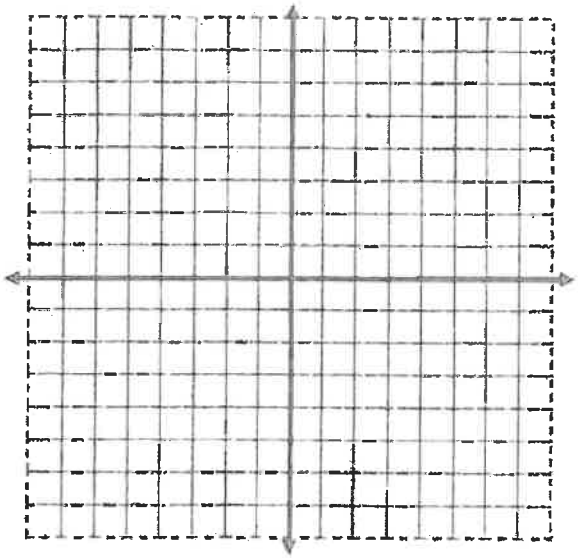
16. A(3, 2) and B(–1, –6) ; draw $\overleftrightarrow{AB}$.
C(–4, –2) D(–5, –4) ; draw $\overleftrightarrow{CD}$

Calculate the slopes and explain if the lines are parallel or not.

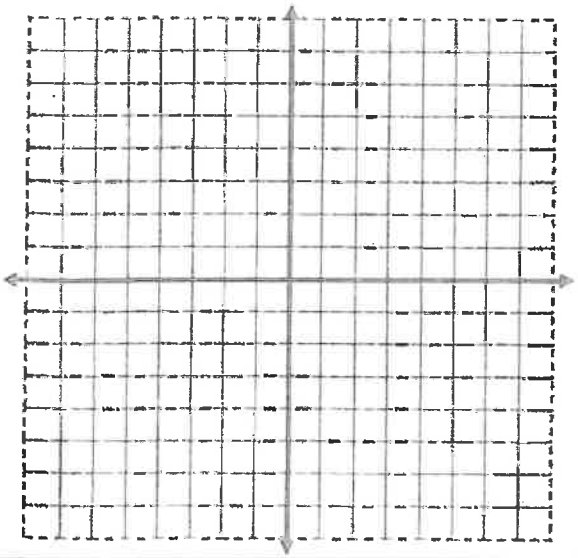


17 – 19: Rewrite each equation in slope-intercept form, y = mx + b. Identify the slope, m, and the y-intercept, b. Then graph.

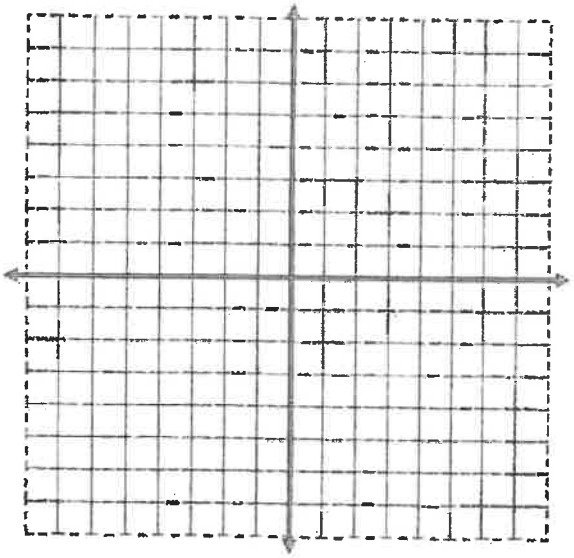
17. $x+y=6$



18. $4x+2y=8$

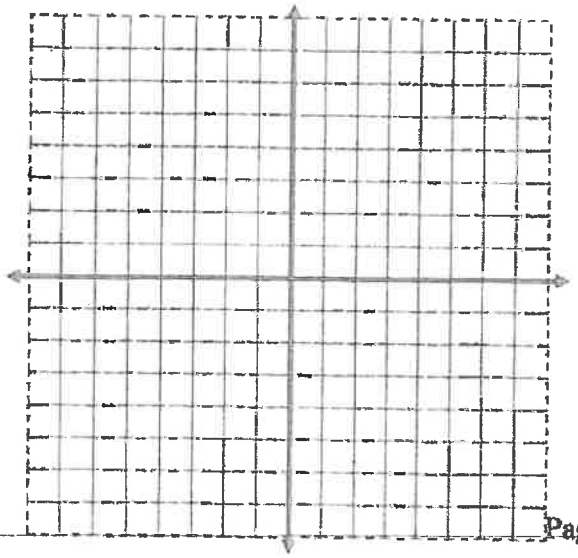


19. $2x-6y=12$



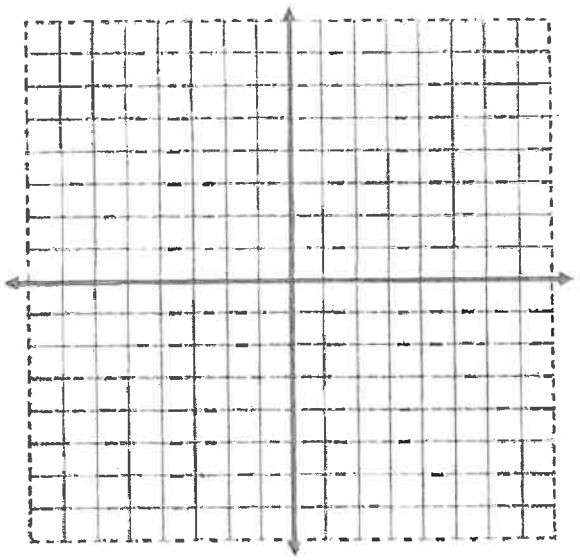
20. Graph both equations. Identify the point of intersection

$4x+2y=14$ $-4x+3y=-9$

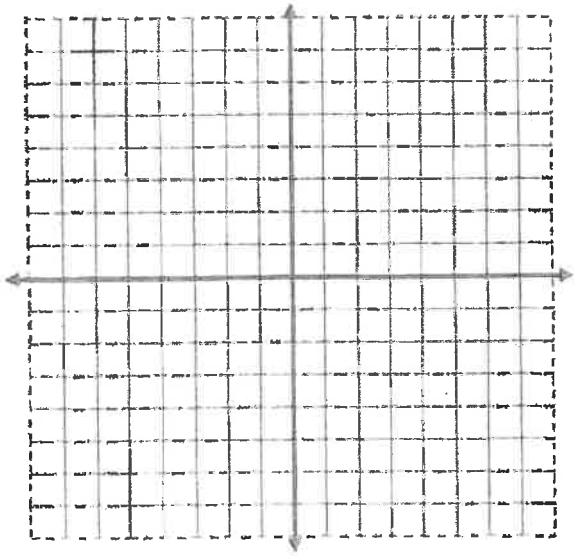


21 – 22: Find the x and y intercepts of the equation. Plot the intercepts and graph the line.
Remember: to find the x intercept, let y = 0
to find the y intercept, let x = 0

21. $6x-3y=12$



22. $25x+10y=50$



23 – 29: Write the equation of the line in slope-intercept form using the given information

Follow these steps:
1: identify the slope (if necessary- use the slope formula)

2: identify the y intercept (if necessary- substitute the slope and the coordinates of one of the points into y = mx + b. solve for b)

3: use the results of the first two steps to write the equation

23. slope = $\frac{3}{4}$; y intercept is (0, –5)

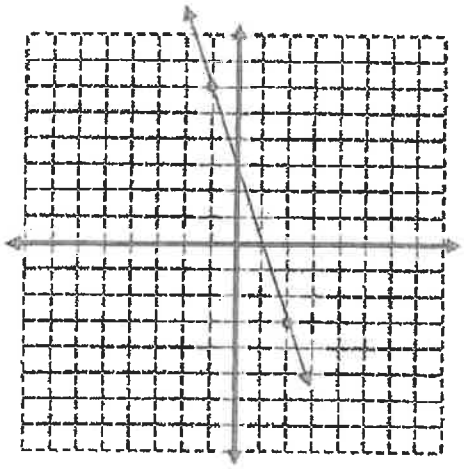
24. slope = -3; passes through (4, –3)

25. slope = $\frac{2}{3}$; passes through (–3, 5)

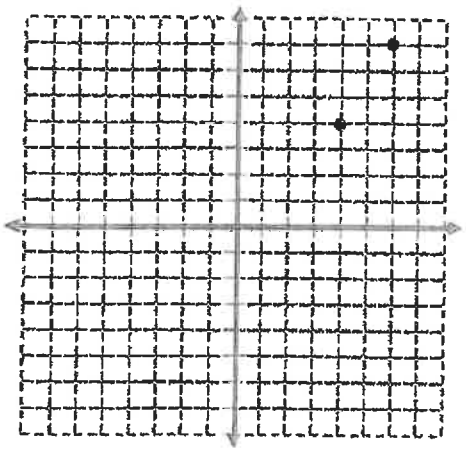
26. passes through (2, –3) and (5, –9)

27. passes through (–5, 3) and (7, 9)

28. Write the equation of the line in the graph



29. Sketch the line that passes through the two points. Write the equation of the line.



PART 3: Linear Systems

30 – 35: Solve each system of equations using the method of your choice (substitution or combination)

30. $x+y=12$
$x-y=2$

31. $2x+y=5$
$2x=14$

32. $4x+3y=13$
$y=-x+4$

33. $\begin{aligned} 4x+2y&=4 \\ 6x+2y&=8 \end{aligned}$

34. $\begin{aligned} \frac{1}{3}x+y&=\frac{5}{3} \\ 5x-y&=1 \end{aligned}$

35. $\begin{aligned} 2x-3y&=6 \\ 6x-9y&=9 \end{aligned}$

PART 4: Quadratic Equations, Polynomials, and Radicals

36 – 39: Simplify the expressions by using the distributive property

36. $(x+11)^2$

37. $(3x-4)^2$

38. $5x(2x-4y+9)$

39. $-3x(x^2+2x-7)$

40 – 41: Solve the equation by taking the square root of both sides (there are two solutions!)

40. $2x^2=50$

41. $5^2+b^2=13^2$

42 – 45: Solve by factoring

Example:

$x^2+5x=-6$ *original equation*

$x^2+5x+6=0$ *put in standard form*

$(x+3)(x+2)=0$ *factor*

$x+3=0$ *or* $x+2=0$ *zero product property*

$x=-3$ *or* $x=-2$ *two solutions*

42. $x^2+6x+8=0$

43. $x^2+5x+6=-x^2-3x$

44. $3x^2+7x-8=-10$

45. $2x^2-4x+2=0$

46 -47: Solve by using the quadratic formula:

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

(Use a calculator to estimate answers to the nearest hundredth)

46. $x^2-3x+1=0$

47. $5x^2+2x-2=0$

48 – 51: Simplify the radical expression (Do not estimate with a calculator)
Example:

$$\sqrt{24} = \sqrt{4} \bullet \sqrt{6} = 2\sqrt{6}$$

48. $\sqrt{32}$

49. $2\sqrt{75}$

50. $\left(4\sqrt{3}\right)^2$

51. $\left(5\sqrt{6}\right)\left(3\sqrt{3}\right)$

52 – 53: Simplify by rationalizing the denominator
Example:

$$\frac{15}{\sqrt{5}} = \frac{15}{\sqrt{5}} \bullet \frac{\sqrt{5}}{\sqrt{5}} = \frac{15\sqrt{5}}{5} = 3\sqrt{5}$$

52. $\frac{15}{\sqrt{3}}$

53. $\frac{40}{\sqrt{2}}$

PART 5: Geometry and Applications

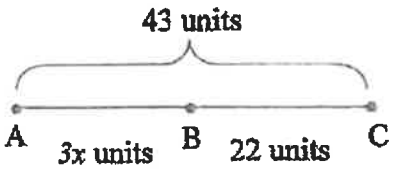
54. Given triangle ABC: $m\angle A = 65°$, $m\angle B = n°$, $m\angle C = (4n)°$. Find the measure of each angle. (Remember, the sum of the three angles of a triangle equals 180°)
Equation: _____ + _____ + _____ = _____

$m\angle A = 65°$

$m\angle B =$ _____

$m\angle C =$ _____

55. The length of line segment AC is 43 units. Segment AB is 3x and segment BC is 22. What is the length of segment AB? What is the value of x?



56 – 59: Sketch the given figure and label its dimensions. Find the area and perimeter.

56. A rectangle with length 3.6 cm and width 4.2 cm

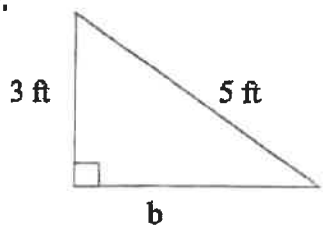
57. A square with a side length of 9 mm.

58. Find the circumference and area of a circle with a radius of 4 in. (use 3.14 for pi and round answers to the nearest tenth of a unit)

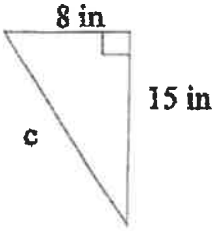
59. Find the area of a triangle with base length of 10 cm and a height of 8 cm.

60 – 61: Use the Pythagorean theorem ($c^2 = a^2 + b^2$) to find the missing side length in the triangle.

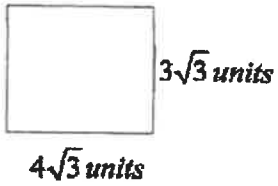
60.



61.



62. Find the area of the rectangle



63. **Answer in complete sentences where appropriate. Show all your work to receive full credit.**
Square Deal Pizza offers square pizza that is 15 inches long on each side. A cheese pizza costs $9.00.
Roundoff Pizza offers circular pizza that is 16 inches in diameter. A cheese pizza at Roundoff costs $8.75.
- Which restaurant's pizza is bigger? Justify your answer using words, symbols, or both.
- Which restaurant's pizza is a better buy? Justify your answer using words, symbols, or both.