Name _____

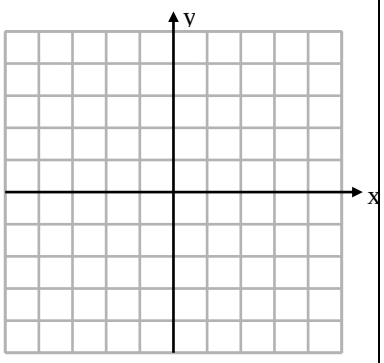
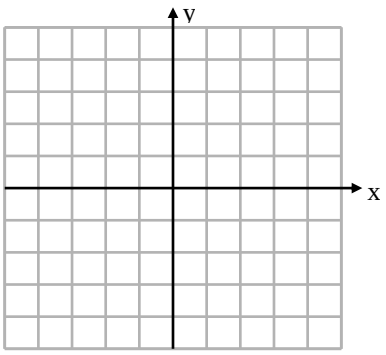
Osbourn High School *Honors Geometry* Summer Problems 2023
(Due one week after the first class meets in August)

Show all work: no work = no credit. Write final answers on the blank provided. You may verify your answers with a graphing calculator, but all work must be shown in the space provided, or on an attached paper, to receive any credit.

I. Solve each equation. Show all steps.

1	$6(x+5) = -36$ **1** _____	2	$4y+2 = 6(8y-7)$ **2** _____
3	$\frac{3}{4}(2x+6) = 28$ **3** _____	4	$\frac{3(x+5)}{7} = \frac{4x+1}{9}$ **4** _____
5	$\frac{x}{x+2} = \frac{x-3}{x+1}$ **5** _____	6	$(2x+5)+(4x-23)+5x = 180$ **6** _____

II. Graph the linear equations using slope and y-intercept. Solve for y where necessary ($y = mx+b$, slope intercept format) or use 2 intercepts. Draw the graph in the box next to each question and state the slope and y-intercept $(0,y)$ if it exists.

7	$y = -\frac{3}{4}x+1$ m = _____ y-intercept = ____		8	3x+4y=-12 m = _____ y-intercept = ____	

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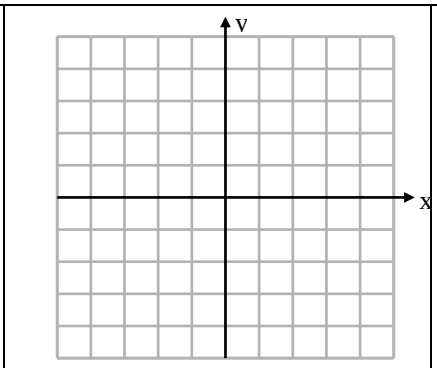
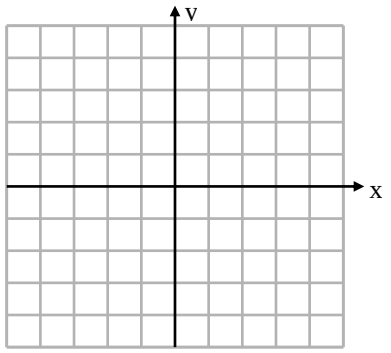
9 $y = x$



m = _____

y–intercept = ____

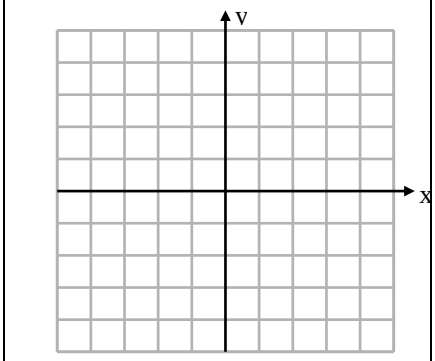
10 $3x - 6y = 12$



m = _____

y–intercept = ____

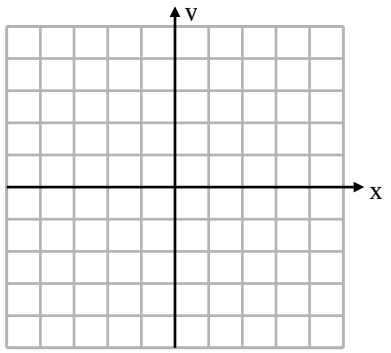
11 $y = -2$



m = _____

y–intercept = ____

12 $x = 5$



m = _____

y–intercept = ____

III. Solve the systems of linear equations using graphing (show graphs), substitution or elimination, your choice. Show all work.

13 $\begin{cases} x - y = 7 \\ 3x + 2y = 6 \end{cases}$

13 _(___,___)_

14 $\begin{cases} y = 2x + 3 \\ y = -\frac{3}{2}x - 4 \end{cases}$

14 _(___,___)_

15 $\begin{cases} x - y = 13 \\ y - x = -13 \end{cases}$

15 _(___,___)_

16 $\begin{cases} y = -2x + 6 \\ 3x + 4y = 24 \end{cases}$

16 _(___,___)_

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IV. Write the equation of the line with the given points and/or slope. Write the final equation in slope–intercept form ($y = mx + b$) if possible. Show all steps.

17	m=2; (4, 5) **17** _____	18	$m = -\frac{2}{3}; (-9, 2)$ **18** _____
19	(4, –5); (–6, 10) **19** _____	20	Undefined slope (–8 ,1) **20** _____
21	m=0; (–2, –5) **21** _____	22	(–3, –2); (0 ,9) **22** _____

V. Determine whether the equations represent lines that are **parallel, perpendicular or neither (oblique).** Indicate **why** this is true. *Hint: solve for slope–intercept form* $y = mx + b$ *and compare slopes.*

23	$\begin{cases} y = -3x + 2 \\ y = 3x + 12 \end{cases}$ **23** _____	24	$\begin{cases} 4x - y = 9 \\ 4x - y = -13 \end{cases}$ **24** _____

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25	$\begin{cases} x+2y=-12 \\ 2x-y=-9 \end{cases}$ **25** _____	26	$\begin{cases} y=x \\ y=-x+9 \end{cases}$ **26** _____

VI. Simplify the radical expressions. **Rationalize all denominators**! Show all work.

27	$\sqrt{50}$ **27** _____	28	$\sqrt{200}$ **28** _____
29	$\frac{3}{\sqrt{2}}$ **29**_____	30	$\frac{3\sqrt{2}}{\sqrt{3}}$ **30**_____

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VII. Solve the quadratic equations by taking the **square root** of both sides, **factoring**, or using the **quadratic formula**: $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, your choice. Remember to set the equation equal to zero first when factoring or using the quadratic formula! Simplify answers; leave irrational answers in radical form. You must show all your work to receive credit. *Attach additional pages if necessary.*

31	$x^2 + 5x + 6 = 0$ **31**_____	32	$3x^2 - 14x - 5 = 0$ **32**_____
33	$3x^2 - 27 = 0$ **33**_____	34	$4x^2 - 2x = 0$ **34**_____
35	$-x^2 + 4x = -12$ **35**_____		

**** End of Summer Problems for Honors Geometry at*** Osbourn High School ******

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