

Algebra 2 Worksheet
 Combo on TEST 1.3 Concepts

Name: Key

Period: _____

I. Solving Linear Systems Graphically. Solve each system by graphing on a graphing calculator.

<p>1. y_1</p> $\begin{cases} y = \frac{4}{5}x + 2 \\ 3x - 4y = -7 \end{cases}$ <p style="text-align: center;">$-3x \quad -3x$</p> $-4y = -3x - 7$ <p>y_2</p> $y = \frac{3}{4}x + \frac{7}{4}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $(-5, -2)$ </div>	<p>2. y_2</p> $\begin{cases} x - y = 27 \\ 2y = 6 - 3x \end{cases}$ <p style="text-align: center;">$-x \quad -x$</p> <p>HINT: Adjust the window.</p> $-y = -x + 27 \rightarrow y = x - 27$ $y = 3 - \frac{3}{2}x$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $(12, -15)$ </div>
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II. Solving Linear Systems Algebraically. Solve each system by the indicated method.

<p>3. $\begin{cases} 6y = 2x - 6 \\ x = 3y + 3 \end{cases}$; substitution</p> $6y = 2(3y + 3) - 6$ $6y = 6y + 6 - 6$ $6y = 6y$ $-6y \quad -6y$ $0 = 0 \quad \text{True}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> infinite solutions </div>	<p>4. $\begin{cases} 4x + 3y = 17 \\ 3x + 2y = 12 \end{cases}$; elimination</p> $\begin{array}{r} 4x + 3y = 17 \\ -4(3x + 2y) = -12 \\ \hline 12x + 9y = 51 \\ + \quad -12x - 8y = -48 \\ \hline y = 3 \end{array}$ $4x + 3(3) = 17$ $4x + 9 = 17$ $4x = 8$ $x = 2$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $(2, 3)$ </div>
<p>5. $\begin{cases} x + 2y = -8 \\ 3x + y = 4 \end{cases}$; your choice</p> $\begin{array}{r} x + 2y = -8 \\ + \quad 6x + 2y = 8 \\ \hline 7x = 0 \\ x = 0 \end{array}$ $0 - 2y = -8$ $-2y = -8$ $y = 4$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $(0, 4)$ </div>	<p>6. $\begin{cases} y = 2x - 5 \\ 4x - 2y = 8 \end{cases}$; your choice</p> $4x - 2(2x - 5) = 8$ $4x - 4x + 10 = 8$ $10 \neq 8$ <p style="color: magenta;">False</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> No solution </div>

III. Word Problems. Write a system to solve the word problem, but DO NOT SOLVE.

<p>7. Brian is 26 years older than his daughter Kim. The sum of their ages is twice the differences of their ages. Find their ages.</p> <p>x = Brian's age y = Kim's Age</p> <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> $\begin{cases} x = y + 26 \\ x + y = 2(x - y) \end{cases}$ </div>	<p>8. Suppose a movie theater sold 200 adult and student tickets for a showing with a revenue of \$995. If the adult tickets were \$5.50 and the student tickets were \$4, how many of each type of ticket were sold?</p> <p>x = # adult tickets y = # student tickets</p> <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> $\begin{cases} x + y = 200 \\ 5.50x + 4y = 995 \end{cases}$ </div>
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IV. Compound and Absolute Value Inequalities. Solve and graph each inequality on a number line.

9. $x - 3 > 2$ OR $2x - 1 \leq 3$
 $x > 5$ $+1 \quad +1$
 $2x \leq 4$
 $x \leq 2$



10. $1 - 2x < -3$ AND $\frac{15}{3} > \frac{3x}{3}$
 $-1 \quad -1$
 $-2x < -4$ $5 > x$
 $-2 \quad -2$
 $x > 2$ $x < 5$



11. $|2x + 3| \geq 9$
 $2x + 3 \geq 9$ or $2x + 3 \leq -9$
 $2x \geq 6$ $2x \leq -12$
 $x \geq 3$ $x \leq -6$



12. $1 - |2x| \geq -5$
 $-|2x| \geq -6$
 $|2x| \leq 6$
 $2x \leq 6$ and $2x \geq -6$
 $x \leq 3$ and $x \geq -3$



V. Absolute Value Equations. Solve each equation.

13. $|x + 5| = 10$
 $x + 5 = 10$ or $x + 5 = -10$
 $x = 5$ or $x = -15$

14. $\frac{2|3n - 2|}{2} = \frac{24}{2}$
 $|3n - 2| = 12$
 $3n - 2 = 12$ or $3n - 2 = -12$
 $3n = 14$ $3n = -10$
 $n = \frac{14}{3}$ or $n = -\frac{10}{3}$

15. $|5d - 6| + 12 = 9$
 $|5d - 6| = -3$
 never!
 \emptyset

VI. Linear Regression.

16. Graph the data in a scatter plot on your graphing calculator using the mean distance from the sun as your independent variable.

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Mean Distance from the sun (AU)	0.387	0.723	1.000	1.523	5.203	9.541	19.190	30.086
Time of one revolution (yr)	0.241	0.615	1.000	1.881	11.861	29.457	84.008	164.784

Correlation coefficient: $r \approx .988$ Line of Best Fit: $y \approx 5.38257x - 8.78750$

Predict the time of one revolution for Pluto if its mean distance from the sun is 39.507 AU. How accurate do you think your prediction is and WHY?

≈ 203.86 years

rather accurate b/c correlation coefficient is extremely close to 1