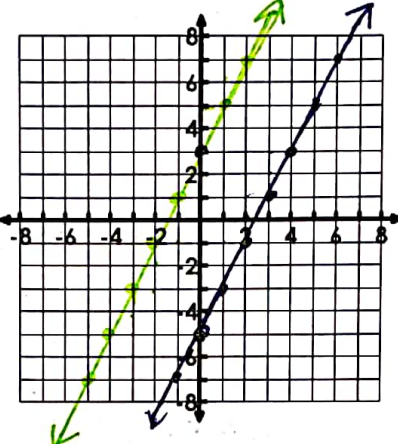
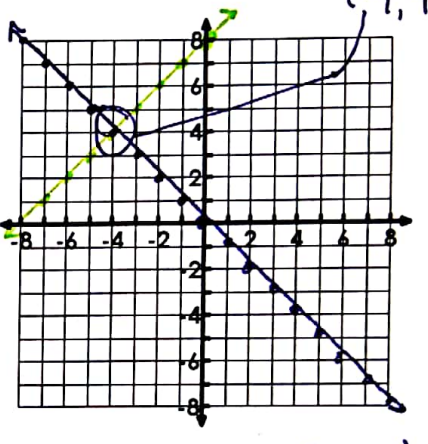


6.1 Systems of Equations Unit Review

What you need to know & be able to do	Things to remember	Examples																															
1. Solve a system of linear equations by graphing .	<p>Make sure each equation is solved for y.</p> <p>Graph both equations and find where they intersect.</p>	<p>1. Solve the system.</p> $\begin{aligned} y &= 2x + 3 \\ y &= 2x - 5 \end{aligned}$  <p>NO SOLUTION</p> <ul style="list-style-type: none"> • same slope • different y-intercept 	<p>2. Solve the system.</p> $\begin{aligned} x &= y - 8 \rightarrow y = x + 8 \\ y &= -x \end{aligned}$  <p>ONE SOLUTION: (-4, 4)</p> <ul style="list-style-type: none"> • different slope • different y-intercept 																														
2. Solve a system of linear equations using substitution .	Use only when one variable is isolated	<p>3. Solve the system of equations.</p> <table border="1"> <thead> <tr> <th>x</th> <th>y = x - 4</th> <th>y = -x</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-4</td> <td>0</td> </tr> <tr> <td>1</td> <td>-3</td> <td>-1</td> </tr> <tr> <td>2</td> <td>-2</td> <td>-2</td> </tr> <tr> <td>3</td> <td>-1</td> <td>-3</td> </tr> </tbody> </table> <p>(2, -2)</p>	x	y = x - 4	y = -x	0	-4	0	1	-3	-1	2	-2	-2	3	-1	-3	<p>4. Solve the system of equations.</p> <table border="1"> <thead> <tr> <th>x</th> <th>y = 2/5x</th> <th>y = -x - 7</th> </tr> </thead> <tbody> <tr> <td>-10</td> <td>-4</td> <td>3</td> </tr> <tr> <td>-5</td> <td>-2</td> <td>-2</td> </tr> <tr> <td>0</td> <td>0</td> <td>-7</td> </tr> <tr> <td>5</td> <td>2</td> <td>-12</td> </tr> </tbody> </table> <p>(-5, -2)</p>	x	y = 2/5x	y = -x - 7	-10	-4	3	-5	-2	-2	0	0	-7	5	2	-12
x	y = x - 4	y = -x																															
0	-4	0																															
1	-3	-1																															
2	-2	-2																															
3	-1	-3																															
x	y = 2/5x	y = -x - 7																															
-10	-4	3																															
-5	-2	-2																															
0	0	-7																															
5	2	-12																															
		<p>5. Solve the system.</p> $\begin{aligned} y &= -5x + 9 \\ 10x - 7y &= -18 \end{aligned}$ $y = -5x + 9$ $10x - 7(-5x + 9) = -18$ $10x + 35x - 63 = -18$ $45x - 63 = -18$ $45x = 45$ $x = 1$ $y = -5(1) + 9$ $y = -5 + 9$ $y = 4$ <p>(1, 4)</p>	<p>6. Solve the system.</p> $\begin{aligned} y &= -8x - 16 \\ y &= 3x - 5 \end{aligned}$ $y = 3x - 5$ $y = -8x - 16$ $3x - 5 = -8x - 16$ $11x - 5 = -16$ $11x = -11$ $x = -1$ $y = 3(-1) - 5$ $y = -3 - 5$ $y = -8$ <p>(-1, -8)</p>																														

<p>3. Solve a system of linear equations using elimination.</p>	<p>To eliminate a variable using addition or multiplication one coefficient must be positive and one must be negative.</p>	<p>7. Solve the system:</p> $\begin{array}{r} x - y = 11 \\ 2x + y = 19 \end{array}$ <hr/> $3x = 30$ $x = 10$ $x - y = 11$ $10 - y = 11 \quad (10, -1)$ $-y = 1$ $y = -1$	<p>8. Solve the system:</p> $\begin{array}{r} 4x = 20 - 8y \rightarrow 4x + 8y = 20 \\ -4x + 2y = -30 \end{array}$ <hr/> $10y = -10$ $y = -1 \quad (7, -1)$ $-4x + 2(-1) = -30$ $-4x - 2 = -30$ $-4x = -28$ $x = 7$
<p>4. Special Types of Systems</p> <p>X</p>	<p>No Solution:</p> <ul style="list-style-type: none"> False Equations Slopes are the same Y-intercepts are different Parallel Lines <hr/> <p>Infinite Solutions:</p> <ul style="list-style-type: none"> True Equations Equations are the same One Line 	<p>9. Solve the system:</p> $\begin{array}{r} 2x + 3y = 12 \\ 5x - y = 13 \end{array}$ $3(5x - y = 13) \rightarrow 15x - 3y = 39$ <hr/> $17x = 51$ $x = 3$ $2x + 3y = 12$ $2(3) + 3y = 12 \quad (3, 2)$ $6 + 3y = 12$ $3y = 6$ $y = 2$	<p>10. Solve the system:</p> $\begin{array}{r} -2(-3x - 8y = 0) \rightarrow 6x + 16y = 0 \\ 3(-2x - 10y = 14) \rightarrow -6x - 30y = 42 \end{array}$ <hr/> $-14y = 42$ $y = -3$ $-3x - 8y = 0$ $-3x - 8(-3) = 0 \quad (8, -3)$ $-3x + 24 = 0$ $-3x = -24$ $x = 8$
		<p>11. Solve the system:</p> $\begin{array}{r} y = 2x - 2 \\ -2x + y = 1 \end{array}$ $y = 2x - 2$ $-2x + (2x - 2) = 1$ $-2 = 1$ <p>NO SOLUTION</p> <ul style="list-style-type: none"> same slope different y-int. 	<p>12. Solve the system:</p> $\begin{array}{r} -9x - 3y = -18 \rightarrow -9x - 3y = -18 \\ 3(3x + y = 6) \rightarrow 9x + 3y = 18 \end{array}$ <hr/> $0 = 0$ <p>INFINITE SOLUTION</p> <ul style="list-style-type: none"> same slope same y-int.

<p>5. Systems with Real World Scenarios</p>	<p>Define your variables</p> <p>Determine if slope intercept or standard form is best</p> <p>Set up your equations and solve using elimination or substitution.</p> <p>Break Even Point: where the cost equal the income</p>	<p>13. One high speed internet provider has a \$50 set up fee and costs \$30 per month. Another provider has no set up fee and costs \$40 per month. In how many months will both providers costs the same? What will that cost be?</p> <p>$y = 30x + 50$ $y = 40x + 0$ $30x + 50 = 40x + 0$ $50 = 10x$ $5 = x$</p> <p>$y = 40x$ (5, 200) $y = 40(5)$ $y = 200$</p>	<p>14. Sam spent \$24.75 to buy 12 flowers for his mother. Roses cost \$2.50 each and daisies costs \$1.75 each. How many of each flower type did he purchase?</p> <p>$x = \text{roses}$ $y = \text{daisies}$ $x + y = 12 \rightarrow y = 12 - x$ $2.5x + 1.75y = \\$24.75$ $2.5x + 1.75(12 - x) = 24.75$ $2.5x + 21 - 1.75x = 24.75$ $0.75x + 21 = 24.75$ $0.75x = 3.75$ $x = 5$ (5, 7) $y = 12 - x$, $y = 12 - 5 = 7$</p>
	<p>15. Explain what a break-even point is.</p> <p>What will the income and cost always be at the break-even point?</p> <p>What is the profit at the break-even point?</p>	<p>NOT REQUIRED</p>	<p>16. As a fundraiser for a band trip, AHS plans to sell hats with the school logo. The company producing the hats charges \$240 for the design and set up plus \$8 per hat. The band members will sell the hats for \$12 each. What is the break-even point? What will the cost and income be?</p>

Multiple Choice Practice

17. Taxi Company A charges $\text{\$4}$ plus $\text{\$0.50}$ per mile. Taxi Company B charges $\text{\$5}$ plus $\text{\$0.25}$ per mile. Which system best represents this problem?

initial + rate
 $y = 0.5x + 4$
 $y = 0.25x + 5$

- (a) $Y = 4x + 0.5$
 $Y = 5x + 0.25$
- (c) $Y = 0.5x + 4$
 $Y = 0.25x + 5$
- (b) $Y = 4x + 0.25$
 $Y = 5x + 0.5$
- (d) $Y = 0.5x + 5$
 $Y = 0.25 + 4$

18. The Fun Guys game rental store charges an annual fee of $\text{\$5}$ plus $\text{\$5.50}$ per game rented. The Game Bank charges an annual fee of $\text{\$60}$ for unlimited game rentals. For how many game rentals will the cost be the same at both stores? What is the cost?

initial + rate
 $y = 5.50x + 5$
 $y = 0x + 60 = 60$
 $5.50x + 5 = 60$
 $5.5x = 55$
 $x = 10$

- (a) Month 4; $\text{\$27}$
- (c) Month 8; $\text{\$49}$
- (b) Month 10; $\text{\$60}$
- (d) Month 14; $\text{\$82}$

19. Solve the system of equations:

$$\begin{aligned} 4x - 4y &= -16 \\ -2(x - 2y) &= -12 \end{aligned} \rightarrow \begin{aligned} 4x - 4y &= -16 \\ -2x + 4y &= 24 \end{aligned}$$

$$2x = 8 \rightarrow x = 4$$

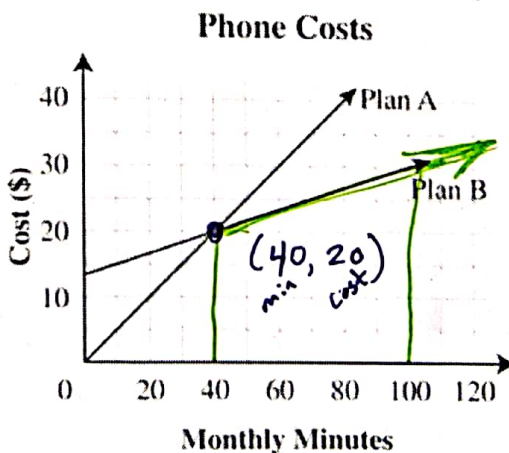
$$\begin{aligned} x - 2y &= -12 \\ (4) - 2y &= -12 \\ -2y &= -16 \\ y &= 8 \end{aligned}$$

- (a) $(8, -4)$
- (c) $(4, 8)$
- (b) $(-2, 4)$
- (d) $(4, -8)$

20. The graph to the right shows the cost of two phone plans. How many minutes does a person need to call each month so that Plan B is the less expensive plan to use?

- (a) Less than 10 minutes
- (b) Less than 40 minutes
- (c) More than 40 minutes
- (d) More than 30 minutes but less than 40 minutes

Use the graph below to answer the question.



21. A student store sold a total of 55 shirts for $\text{\$620}$. The shirts sold were either red or white. If the red shirts sold for $\text{\$12}$ each and the white sold for $\text{\$10}$ each, how many of each color shirt were sold?

total

$$\begin{aligned} x + y &= 55 \rightarrow y = 55 - x \\ 12x + 10y &= 620 \end{aligned}$$

$$\begin{aligned} 12x + 10(55 - x) &= 620 \\ 12x + 550 - 10x &= 620 \\ 2x + 550 &= 620 \\ 2x &= 70 \\ x &= 35 \end{aligned}$$

- (a) 20 red, 35 white
 (c) 28 red, 27 white

$$y = 55 - 35x$$

$$y = 20x$$

(35, 20)

- (b) 27 red, 28 white
 (d) 35 red, 20 white

22. Consider each system of equations below. Just by looking at the equations, tell how many solutions the system will have and explain why. **NOT MULTIPLE CHOICE!**

a. $\begin{cases} y = 4x - 3 \\ y = 4x - 2 \end{cases}$

NO SOLUTION
 • same slope
 • different y-int

b. $\begin{cases} y = \frac{1}{3}x + 5 \\ y = \frac{1}{3}x + 5 \end{cases}$

INFINITE SOLUTION
 • same slope
 • same y-int.

c. $\begin{cases} y = -x + 2 \\ y = \frac{1}{3}x + 6 \end{cases}$

ONE SOLUTION
 • different slope
 • different y-int.

d. $\begin{cases} y = -\frac{3}{4}x + 5 \\ y = -\frac{3}{4}x - 4 \end{cases}$

NO SOLUTION
 • same slope
 • different y-int