Best Choice Worksheet

This Column:	This Column:
• State the BEST way to solve the system. • Solve each system using the BEST method. • State the answer as a point.	• State the BEST way to solve the system. • Complete the first step that you would do to solve the problem. • YOU DON'T HAVE TO FINISH! • If you would like extra practice solve these problems.

1. $2x + 4y = -18$ Elimination $(-3,-3)$
   $+ \;\; 5x - 4y = -3$

   $\dfrac{7x}{7} = \dfrac{-21}{7}$ $2(-3)+4y = -18$
   $\qquad\qquad -6 + 4y = -18$
   $x = -3$ $+6 \qquad +6$
   $\qquad\qquad 4y = -12$
   $\qquad\qquad \quad y = -3$

2. $-3x - 5y = -16$ Elimination
   $+ \;\; 3x - y = 22$
   _____
   $\qquad -6y = 6$

3. $2x + 4y = 16$ Elimination $(-2,5)$
   $+ \; -2x + 4y = 24$
   _____
   $\dfrac{8y}{8} = \dfrac{40}{8}$ $2x + 4(5) = 16$
   $\qquad\qquad 2x + 20 = 16$
   $y = 5$ $-20 \; -20$
   $\qquad\qquad \dfrac{2x = -4}{2}$
   $\qquad\qquad\qquad x = -2$

4. $x + y = -6$ Elimination
   $\downarrow \;\; -x + 3y = 6$
   _____
   $\qquad 4y = 0$

5. $x + 3x = 7 - 3y$ Substitution $(1,2)$
   $\quad -5x - 3y = -11$
   $-5(7-3y) - 3y = -11$ $x + 3(2) = 7$
   $-35 + 15y - 3y = -11$ $x + 6 = 7$
   $-35 + 12y = -11$ $-6 \; -6$
   $+35 \qquad +35$ $x = 1$
   $\dfrac{12y = 24}{12}$ $y = 2$

6. $5x + 3y = 15$ Elimination
   $(-3x + 3y = -9) \cdot -1$

   $3x - 3y = 9$

7. $x + 3x = -8 - 3y$ Substitution $(-8,0)$
   $\quad x + 4y = -8$
   $-8 + 3y + 4y = -8$ $x + 3(0) = -8$
   $-8 + y = -8$ $x = -8$
   $+8 \qquad +8$
   $\quad y = 0$

8. $-4x + y = -36 + 4x$ Substitution
   $\quad -4x + 3y = -28$

9. $(-5x - 4y = 20)^2$ Elimination $(-4,0)$
   $\quad 2x - 8y = -8$
   $10x + 8y = -40$ $-5(-4) - 4y = 20$
   _____ $20 - 4y = 20$
   $\dfrac{12x = -48}{12}$ $-20 \quad -20$
   $\qquad\qquad \dfrac{-4y = 0}{-4}$
   $x = -4$
   $\qquad\qquad y = 0$

10. $x + y = -7$ Elimination
    $+ \;\; 4x - y = -3$
    _____
    $\quad 5x = -10$

11. $3x - 3y = -18$)3 Elimination $(-6, 0)$ $-9x + 5y = 54$ $+\ \ 9x - 9y = -54$ $\quad\quad \dfrac{-4y = 0}{-4}$ $\quad\quad y = 0$ $3x - 3(0) = -18$ $3x = -18$ $\quad \dfrac{}{3}$ $\quad\quad x = -6$	12. $-x + y = -27$ +4x Substitution $-12x + 2y = -86$
13. $5x + 3y = 60$ Elimination $(6, 10)$ $(-x + 2y = 14)5$ $+\ -5x + 10y = 70$ $\quad\quad \dfrac{13y = 130}{13}$ $\quad\quad y = 10$ $5x + 3(10) = 60$ $5x + 30 = 60$ $\dfrac{5x = 30}{5}$ $\quad\quad x = 6$	14. $-5x - 2y = 54$ Substitution $x - 5y = 0$ $\quad +5y\ \ +5y$ $\quad x = 5y$
15. $(5x - 5y = 10)3$ Elimination $(4, 2)$ $(3x + 3y = 18)-5$ $15x - 15y = 30$ $-15x - 15y = 90$ $\dfrac{-30y = -60}{-30}\ \ y = 2$ $5x - 5(2) = 10$ $5x - 10 = 10$ $\quad +10\ \ +10$ $\dfrac{5x = 20}{5}\ \ x = 4$	16. $4x + 5y = 23$ Elimination $(-x - 3y = -11)4$ $-4x - 12y = -44$
17. $(5x + 4y = 57)4$ Elimination $(5, 8)$ $(4x - 5y = -20)-5$ $20x + 16y = 228$ $+\ 20x + 25y = 100$ $\dfrac{41y = 328}{41}$ $\quad y = 8$ $5x + 4(8) = 57$ $5x + 32 = 57$ $\quad -32\ \ -32$ $\dfrac{5x = 25}{5}$ $\quad x = 5$	18. $y = -4x + 42$ Substitution $2y + 3x = 44$ $2(-4x + 42) + 3x = 44$
19. $3x = y + 23$ Substitution $(10, 7)$ $x = 3y - 11$ $3(3y - 11) = y + 23$ $9y - 33 = y + 23$ $-y + 33\ \ -y + 33$ $\dfrac{8y = 56}{8}\ \ y = 7$ $x = 3(7) - 11$ $x = 21 - 11$ $x = 10$	20. $y = -3x + 18$ Substitution $5y - 2x = 22$ $5(-3x + 18) - 2x = 22$
21. $4x = -5y + 66$ Substitution $(9, 6)$ $x = -4y + 33$ $4(-4y + 33) = -5y + 66$ $-16y + 132 = -5y + 66$ $+5y\ -132\ \ +5y\ -132$ $\dfrac{-11y = -66}{-11}$ $\quad y = 6$ $x = -4(6) + 33$ $x = -24 + 33$ $x = 9$	22. $x = 5y + 13$ Substitution $x + 3y = -3$ $5y + 13 + 3y = -3$

2

For the following problems:
- Define your variables.
- Write two equations for the problem.
- State the BEST method to solve the system.
- Using the BEST method find the solution and write it as a point.
- Write a sentence to explain what your answer means.

31. Find the value of the two numbers if their sum is 12 and their difference is 4. Elimination (8,4)

$$x + y = 12$$
$$+ \ x - y = 4$$
$$\overline{2x = 16}$$
$$x = 8$$

$$\frac{8 + y = 12}{-8 \quad -8}$$
$$y = 4$$

32. The difference to two numbers is 3. Their sum is 13. Find the numbers. Elimination (8,5)

$$x - y = 3$$
$$+ \ x + y = 13$$
$$\overline{2x = 16}$$
$$x = 8$$

$$\frac{8 - y = 3}{-8}$$
$$-y = -5$$
$$\frac{-1}{y = 5}$$

33. The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 children's tickets. Find the price of a senior citizen ticket and the price of a child's ticket. Substitution (4,14)

$$x = \text{senior ticket} \qquad x = \text{child ticket}$$

$$\frac{-3x + y = 38 - 3x}{-3x}$$
$$3x + 2y = 52$$

$$3x + 2(38 - 3x) = 52$$
$$3x + 76 - 6x = 52$$
$$\frac{-76 \quad -76}{}$$

$$\frac{-3x = -24}{3}$$
$$x = 8$$

$$3(8) + y = 38$$
$$24 + y = 38$$
$$\frac{-24 \quad -24}{y = 14}$$

it cost $8 for a senior citizen and $14 for a child.

34. The state fair is a popular field trip destination. This year the senior class at Laurel High School and the senior class from Billings High School both planned trips there. The senior class at Laurel High School rented and filled 8 vans and 8 buses with 240 students. Billings High School rented and filled 4 vans and 1 buss with 54 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus. Substitution (8,22)

$$x = \# \text{ in van} \qquad y = \# \text{ in bus}$$

$$240 = 8x + 8y$$
$$\frac{54 = 4x + y}{-4x \quad -4x}$$
$$54 - 4x = y$$

$$240 = 8x + 8(54 - 4x)$$
$$240 = 8x + 432 - 32x$$
$$\frac{-432 \qquad -432}{}$$
$$-192 = -24x$$
$$\overline{-24}$$
$$x = 8$$

$$240 = 8(8) + 8y$$
$$240 = 64 + 8y$$
$$\frac{-64 \quad -64}{}$$
$$176 = 8y$$
$$y = 22$$

8 students can fit in a van and 22 can fit in a bus!

35. Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 3 adult tickets and 9 children's tickets for a total of $75. The school took in $67 on the second day by selling 8 adult tickets and 5 children's tickets. What is the price for an adult ticket and a children's ticket?

x = adult ticket $ y = $ child ticket   Elimination

$(75 = 3x + 9y)8$ $600 = 24y + 72y$ $75 = 3x + 9(7)$
$(67 = 8x + 5y)-3$ $-201 = -24x - 15y$ $75 = 3x + 63$
              $\overline{399 = 57y}$ $-63 \quad -63$

Adults tickets cost $4 $\frac{399}{57}$ $y = 7$ $\frac{12}{3} = \frac{3x}{3}$
and child's cost $7 (4,7) $x = 4$

36. A store sold a total of 125 car stereo systems and speakers in one week. The car stereo systems were sold for $104.95, and the speakers sold for $18.95. The total sales from these two items totaled $6926.95. How many car stereo systems and speakers were sold? Round to the nearest whole

They sold 53 car stereos and 72 speakers

x = # of car stereos y = # of speakers   Substitution (53,72)

                              $6926.95 = 13118.75 - 86y$
$125 = x + y$ $x = 125 - y$
$-y \quad -y$ $\frac{-6191.8}{-86} = \frac{-86y}{-86}$
$6926.95 = 104.95x + 18.95y$ $y = 72$
$6926.95 = 104.95(125 - y) + 18.95y$
$6926.95 = 13118.75 - 104.95y + 18.95y$ $125 = x + 72$
                             $-72 \quad -72$
                             $53 = x$

37. On the windowsill is a plant that is 35 centimeters tall. It is growing 5 centimeters per week. A second plant, which is 41 centimeters tall, is on the coffee table. It is growing 3 centimeters per week. Eventually the two plants will be the same height. At what week will the plants be the same height in centimeters?

x = weeks y = height   Substitution

$y = 5x + 35$ $y = 5(3) + 35$ In 3 weeks
$y = 3x + 41$ $y = 15 + 35$ both plants will
                      $y = 50$ be 50 centimeters.
$3x + 41 = 5x + 35$
$-3x - 35 \quad -3x - 35$ $(3,50)$
    $\frac{6}{2} = \frac{2x}{2}$ $x = 3$

38. A nature center charges $35.25 for a yearly membership and $6.25 for a single admission. Last week it sold a combined total of 50 yearly memberships and single admissions for $660.50. How many memberships and how many single admissions were sold? x = yearly memberships y = single admission

$660.50 = 35.25x + 6.25y$
   $50 = x + y$
   $-x \quad -x$ $50 = 12 + y$ $(12,38)$
   $50 - x = y$ $-12 \quad -12$

$660.50 = 35.25x + 6.25(50 - x)$ $38 = y$
$660.50 = 35.25x + 312.50 - 6.25x$ They sold 12 yearly
$660.50 = 29x + 312.50$ memberships and 38
$-312.50 \quad\quad -312.50$ single admissions
   $\frac{348}{29} = \frac{29x}{29}$ $x = 12$

4