WORKSHEET- SYSTEMS OF EQUATIONS WORD PROBLEMS

① Let x = senior tickets
    y = student tickets

$4x + 5y = 102$
$-(7x + 5y = 126)$
$-3x \quad = -24$
$\boxed{x = 8}$

$4(8) + 5y = 102$
$32 + 5y = 102$
$5y = 70$
$\boxed{y = 14}$

Senior tickets cost $8.
Student tickets cost $14.

② Let x = plane speed
    y = wind speed.

$x + y = 183$
$+(x - y = 141)$
$2x \quad = 324$
$\boxed{x = 162}$

$x + y = 183$
$(162) + y = 183$
$\boxed{y = 21}$

Plane speed is 162 km/h.
Wind speed is 21 km/h.

③ Let x = apple pies.
    y = lemon pies.

$6x + 4y = 80$
$-(6x + 5y = 94)$
$-1y = -14$
$\boxed{y = 14}$

$6x + 4(14) = 80$
$6x + 56 = 80$
$6x = 24$
$\boxed{x = 4}$

Apple pies cost $4.
Lemon pies cost $14.

④ Let x = senior tickets.
    y = child tickets.

$3x + 3y = 69$
$-(5x + 3y = 91)$
$-2x \quad = -22$
$\boxed{x = 11}$

$3(11) + 3y = 69$
$33 + 3y = 69$
$3y = 36$
$\boxed{y = 12}$

Senior tickets cost $11.
Child tickets cost $12.

⑤ Let x = C.C. Dough
    y = G.B. Dough

$8x + 12y = 364$
$3(1x + 4y = 93)$ $\Rightarrow$

$8x + 12y = 364$
$-(3x + 12y = 279)$
$\overline{\hspace{1cm}5x \hspace{1cm} = 85}$
$\boxed{x = 17}$

$1x + 4y = 93$
$(17) + 4y = 93$
$4y = 76$
$\boxed{y = 19}$

C.C. Dough costs $17.
G.B. Dough costs $19.

⑥ Let x = senior tickets.
    y = child tickets.

$4(3x + 5y = 70)$
$12x + 12y = 216$ $\Rightarrow$

$12x + 20y = 280$
$-(12x + 12y = 216)$
$\overline{\hspace{1cm}8y = 64}$
$\boxed{y = 8}$

$3x + 5(8) = 70$
$3x + 40 = 70$
$3x = 30$
$\boxed{x = 10}$

Senior tickets cost $10.
Child tickets cost $8.

⑦ Let x = plane speed
    y = wind speed.

How fast there?
$\dfrac{580 \text{ miles}}{5 \text{ hours}} = 116 \text{ mi/h}$

$x + y = 116$

How fast back?
$\dfrac{580 \text{ miles}}{10 \text{ hours}} = 58 \text{ mi/h}$

$x - y = 58$

$x + y = 116$
$+(x - y = 58)$
$\overline{\hspace{0.5cm}2x = 174}$
$\boxed{x = 87}$

$x + y = 116$
$(87) + y = 116$
$\boxed{y = 29}$

Plane speed is 87 mi/h.
Wind speed is 29 mi/h.

7) A plane traveled 580 miles to Ankara and back. The trip there was with the wind. It took 5 hours. The trip back was into the wind. The trip back took 10 hours. Find the speed of the plane in still air and the speed of the wind.

   plane: 87 mph, wind: 29 mph

8) Amanda and Ndiba are selling flower bulbs for a school fundraiser. Customers can buy packages of tulip bulbs and bags of daffodil bulbs. Amanda sold 6 packages of tulip bulbs and 12 bags of daffodil bulbs for a total of $198. Ndiba sold 7 packages of tulip bulbs and 6 bags of daffodil bulbs for a total of $127. Find the cost each of one package of tulips bulbs and one bag of daffodil bulbs.

   package of tulips bulbs: $7, bag of daffodil bulbs: $13

9) The local amusement park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 16 vans and 8 buses with 752 students. High School B rented and filled 5 vans and 5 buses with 380 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

   Van: 18, Bus: 58

10) The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 16 vans and 5 buses with 417 students. High School B rented and filled 10 vans and 8 buses with 480 students. Every van had the same number of students in it as did the buses. How many students can a van carry? How many students can a bus carry?

   Van: 12, Bus: 45

11) The senior classes at High School A and High School B planned separate trips to the water park. The senior class at High School A rented and filled 14 vans and 16 buses with 1086 students. High School B rented and filled 10 vans and 13 buses with 870 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.

   Van: 9, Bus: 60

12) Yellowstone National Park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 7 vans and 10 buses with 332 students. High School B rented and filled 4 vans and 15 buses with 459 students. Each van and each bus carried the same number of students. Find the number of students in each van and in each bus.

   Van: 6, Bus: 29