Sections 7.1 – 7.3 I.C.E **Name:** _____

For 1 – 4, solve the system algebraically (Substitution or Elimination).

1) $x+2y=1$
$5x-4y=-23$

2) $x-y=3$
$x-y^2=1$

3) $2x-y+3=0$
$x^2+y^2-4x=0$

4) $2x+y-z=7$
$x-2y+2z=-9$
$3x-y+z=5$

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You can choose any method to solve the problems below- just define your variables, set up two or three equations, and then solve by the method of your choosing.

5) A total of $32,000 is invested in two municipal bonds that pay 5.75% and 6.25% simple interest. The investor wants an annual interest income of $1900 from the investments. How much should be invested in each type of bond?

6) Two planes start from LA International Airport and fly in opposite directions. The second plane starts one half hour after the first plane, but is speed is 80 km/hr faster. Find the airspeed of each plane if 2 hours after the first plane departs, the planes are 3200 km apart.

7) What are the dimensions of a rectangular tract of land if its perimeter is 40 kilometers and its area is 96 square kilometers?

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8) Ten liters of a 30% acid solution is obtained by mixing a 20% solution with a 50% solution. How much of each solution is required to obtain the specified concentration of the final mixture?

9) In Super Bowl I, the Green Bay Packers defeated the Kansas City Chiefs by a score of 35 to 10. The total points scored came from 13 different scoring plays, which were a combination of touchdowns, extra-point kicks, and field goals, worth 6, 1, and 3 points respectively. The same number of touchdowns and extra point kicks were scored. There were six times as many touchdowns as field goals. How many touchdowns, extra-point kicks, and field goals were scored during the game?

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Solutions!

ICE 7.1-7.3

1. $(-3,2)$
2. $(5,2)$ *and* $(2,-1)$
3. no solution
4. no solution

5. $20,000 at 5.75%
   $12,000 at 6.25%

6. F = first plane's speed, S = second plane's speed

   Distance = rate x time F = S - 80
   3200 = (F) x time + (S) x time
   3200 = (S – 80)x 2 hrs + S x 1.5 hrs
   3200 = (2S – 160 + 1.5S)
   1600 = 1.5S – 160
   1760 = 1.5S
   S = 960
   the second plane's speed is 960 km/hr, and the first plane's speed is 880 km/hr

7. 2b + 2h = 40------→ b = 20 - h
   bh = 96 ------→(20 – h)h = 96
   $20h - h^2 = 96$
   $h^2 - 20h + 96 = 0$
   (h – 8)(h – 12) = 0
   h = 8 or h = 12-----→ dimensions are 8km x 12km

8. .50x + .20y = .30 (10)
   x + y = 10----------→ x = 10 - y
   .50(10-y) + .20y = 3
   5 - .50y + .20y = 3
   -.30y = -2 → y = 20/3 liters, so x = 10/3 liters

9. T + E + F = 13---------→ T + T + F = 13 or 6F + 6F + F = 13
   6T + E + 3F = 45 13F = 13
   T = E F = 1--------→ T = 6---→ E = 6
   6F = T There were 6 touchdowns and extra points, and 1 field goal