Math 0310 Homework Exercise Supplement

Chapter 9: Application Problems for Systems of Equations

For the following: a) Define the variable(s) b) Write a system of equations c) Solve. Work all problems on separate paper.

1. A pharmacist has a 45% acid solution and a 35% acid solution. How many liters of each must be mixed to form 80 liters of a 40% acid solution?

2. The total receipts for a basketball game are $1400 for 788 tickets sold. Adults paid $2.50 for admission and students paid $1.25. The ticket takers counted only the number of ticket not the type of tickets. Determine the number of each type of ticket sold.

3. Soybean meal is 16% protein and cornmeal is 9% protein. How many pounds of each should be mixed to get a 350-lb mixture that is 12% protein?

4. A board 12 ft. long is to be cut into two pieces so that one piece is 3 ft. longer than the other piece. Determine the length of each piece.

5. Paint Town sold 45 paintbrushes, one kind at $8.50 each and another at $9.75. In all, $398.75 was taken in for the brushes. How many of each kind were sold?

6. Paul has 35 coins consisting of dimes and nickels. The value of his coins is $3.30. How many of each type does he have?

7. An executive nearing retirement made two investments totaling $15,000. In one year, these investments yielded $1,432 in simple interest. Part of the money was invested at 9% and the rest at 10%. How much was invested at each rate?

8. How many ounces of a 15% saline solution and how many ounces of a 30% saline solution must be combined to produce 60 ounces of a 25% solution?

9. The length of a rectangle is one more than twice the width. If the perimeter of the rectangle is 32 km, find the length and width.
10. Sarah’s two student loans totaled $12,000. One of her loans was at 6% simple interest and the other at 9%. After one year, Sarah owed $855 in interest. What was the amount of each loan?

11. Two cars leave Dallas, one traveling east and the other west. After 3 hours, they are 297 miles apart. If one car is traveling 5 mph faster than the other, what is the speed of each?

12. Tourist: “How many birds and lions do you have in your zoo?” Zookeeper: “There are 30 heads and 100 feet.” Tourist: “I can’t tell from that.” Zookeeper: “Oh, yes, you can!” Can you? Find the number of each.

13. Paul has 56 coins all in quarters and dimes. If the total value is $9.20, how many of each coin does he have?

14. A boat travels 28 miles upstream in 7 hours and 21 miles downstream in 3 hours. Find the rate of the boat in still water and the rate of the current.

15. A plane travels 600 miles in 1.5 hours with a tailwind and 500 miles in 4 hours with a head wind. Find the rate of the plane in still air.
Answers to Math 0310 Homework Exercise Supplement – Chap. 9

1. 40 L of 45% acid solution and 40 L of 35% acid solution

2. 332 adult tickets and 456 student tickets

3. 200 pounds of 9% protein and 150 pounds of 16% protein

4. 4.5 feet and 7.5 feet

5. 13 paintbrushes that cost $9.75 and 32 paintbrushes that cost $8.50

6. 4 nickels and 31 dimes

7. $8200 at 10% and $6800 at 9%

8. 40 ounces at 30% and 20 ounces at 15%

9. width is 5 km and length is 11 km

10. $4500 at 9% and $7500 at 6%

11. 47 mph and 52 mph

12. 20 lions and 10 birds

13. 32 dimes and 24 quarters

14. boat rate is 5.5 mph and current rate is 1.5 mph

15. plane rate is 262.5 and wind rate is 137.5