Investment Problems

1. A dentist invested a portion of $15000 in a 7% annual simple interest account and the remainder in a 6.5% annual simple interest government bond. The two investments earn $1020 in interest annually. How much was invested in each account?
$9000 at 7%, $6000 at 6.5%

2. A university alumni association invested part of $20000 in preferred stock that earns 8% annual simple interest, and the remainder in a municipal bond that earn 7% annual simple interest. The amount of interest earned each year is $1520. How much ws invested in each account?
$12000 at 8%, $8000 at 7%

3. A professional athlete deposited an amount of money into a high-yield mutual fund that earns 13% annual simple interest. A second deposit, $2500 more than the first, was placed in a certificate of deposit earning 7% annual simple interest. In one year, the total interest earned on both investments was $475. How much money was invested in the mutual fund?
$1500

4. Jan Moser made a deposit into a 7% annual simple interest account. She made another deposit, $1500 less than the first, in a certificate of deposit earning 9% annual simple interest. The total interest earned on both investment for one year was $505. How much money was deposited in the certificate of deposit?
$2500

5. A team of cancer research specialists received a grant of $300000 to be used for cancer research. They deposited some of the money in a 10% simple interest account and the remainder in an 8.5% annual simple interest account. How much was deposited in each account if the annual interest is $28500?
$200000 at 10%, $100000 at 8.5%

6. Reggie Means invested part of 30000 in municipal bonds that earn 6.5% annual simple interest and the remainder of the money in 8.5% corporate bonds. How much is invested in each account if the total annual interest earned is $2190?
$18000 at 6.5%, $12000 at 8.5%

7. To Provide for retirement income, Teresa Puelo purchases a $5000 bond that earns 7.5% annual simple interest. How much money does Teresa have invested in bonds that earn 8% annual simple interest if the total annual interest earned from the two investments is $615?
$3000

8. After the sale of some income property, Jeremy Littlefield invested $40000 in a certificate of deposit that earns 7.25% annual simple interest. How much money does he have invested in certificates that earn an annual simple interest rate of 8.5% if the total annual interest earned from the tow investments is $5025?
$25000

9. Suki Hiroshi has made an investment of $2500 at an annual simple interest rate of 7%. How much money does she have invested at an annual simple interest rate of 11% if the total interest earned is 9% of the total investment?
$2500

10. Mae Jackson has a total of $6000 invested in two simple interest accounts. The annual simple interest rate on one account is 9%. The annual simple interest rate on the second account is 6%. How much invested in each account if both accounts earn the same amount of interest?
$3600 at 6%, $2400 at 9%

11. A charity deposited a total of $54000 in two simple interest accounts. The annual simple interest rate on one account is 8%. The annual simple interest rate on the second account is 12%. How much was invested in each account if the total annual interest earned is 9% of the total investment?
$40500 at 8%, 13500 at 12%

12. A sports foundation deposited a total of $24000 into two simple interest accounts. The annual simple interest rate on one account is 7%. The annual simple interest rate on the second account is 11%. How much is invested in each account if the total annul interest earned is 10% of the total investment?
$6000 at 7%, 18000 at 11%

13. Wayne Miller, an investment banker, invested 55% of the bank's available cash in an account that earns 8.25% annual simple interest. The remainder of the cash was placed in an account that earns 10% annual simple interest. The interest earned in one year was $58743.75. Find the total amount invested.
$650000

14. Mohammad Aran, a financial planner, recommended that 40% of a client's cash account be invested in preferred stock earning 9% annual simple interest. The remainder of the client's cash was placed in Treasury bonds earning 7% annual simple interest. The total annual interest earned from the two investments was $2496. Find the total amount invested.
$32000

15. Sarah Ontkean is the manager of a mutual fund. She placed 30% of the fund's available cash in a 6% annual simple interest account, 25% in 8% corporate bonds, and the remainder in a money market fund earning 7.5% annual simple interest. The total annual interest earned from the investments was $35875. Find the total amount invested.
$500000

16. Joseph Abruzzio is the manger of a trust. He invested 30% of a client's cash in government bonds that earn 6.5% annual simple interest, 30% in utility stocks that earn 7% annual ismple interest, and the remainder in an account that earns 8% annual simple interest. The total annual interest earned from the investments was $5437.50. Find the total amount invested.
$75000

Geometry Problems
1. The Perimeter of the rectangular display screen of Amazon's Kindle 3 is 16.8 inches. If the height is 1.2 inches greater than the width, find the dimensions of the screen.
Width: 3.6 in., Length: 4.8 in.

2. The perimeter of a one-dollar bill is 17.5 inchers and the length is 0.92 in. more than twice th width. Find the dimensions of one-dollar bill.
Width: 2.61 in., Length: 6.14 in.

3. A woman wants to enclose a 20 ft by 30 ft pool with a uniform width walkway all around of it. How wide will the walkway be if the perimeter of pool including the walkway is 180 feet?
10 ft

4. A farmer has 624 feet of fencing to enclose a pasture. Because a river runs along one side, fencing will be needed only three sides. Find the dimensions of the pasture if its length is double its width.
156 ft by 312 ft

5. Throughout history, most artists and designers have felt the *golden rectangles* with a length 1.618 times as long as their width have the most visually attractive shape. A woman is planning to make a quilt in the shape of a golden rectangle. She has exactly 22 feet of a special lace that she plans to sew around the edge of the quilt. What should the length and width of the quilt be? Round both answers up to the nearest hundredth.
4.20 ft by 6.80 ft

6. A man has 150 feet of fencing to build the two-part pen, one part is a square and the other is a rectangular. Find the outside dimensions of the pen, if the length of rectangular pen is 5 ft more than the length of square pen.
8 ft by 11 ft

7. In an isosceles triangle, one angle is three times the measure of one of the equal angles. Find the measure of each angle.
36, 36, and 108

8. In a triangle, one angle is twice the measure of the second angle. The third angle is three times the measure of the second angle. Find the measure of each angle.
60, 30, and 90

9. In an isosceles triangle, one angle is 10 less than three times the measure of one of the equal angles. Find the measure of each angle.
38, 38, and 104

Mixture Problems
1. At a veterinary clinic, a special high-protein dog food that costs $6.75 per pound is mixed with a vitamin supplement that costs $3.25 per pound. How many pounds of each should be used to make 5 lb of a mixture that costs $4.65 per pound?
2 lb of dog food, 3 lb of vitamin supplement

2. A wild bird seed mix is made by combining 100 lb of millet seed costing $0.60 per pound with sunflower seeds costing $1.10 per pound. How many pounds of sunflower seeds are needed to make a mixture that costs$0.70 per pound?
25 lb

3. Find the cost per pound of a coffee mixture made from 8 lb of coffee that costs $9.20 per pound and 12 lb of coffee that costs $5.50 per pound.
$6.98

4. How many pounds of chamomile tea that costs $4.20 per pound must be mixed with 12 lb of orange tea that costs $2.25 per pound to make a mixture that cost $3.40 per pound?
17.25 lb

5. A goldsmith combined an alloy that costs $4.30 per ounce with an alloy that cost $1.80 per ounce. How many ounces of each were use to mixture of 200 oz costing $2.50 per ounce?
56 oz of $4.30 alloy, 144 oz of $1.80 alloy

6. An herbalist has 30 oz of herbs costing $2 per ounce. How many ounces of herbs costing $1 per ounce should be mixed with these 30 oz of herbs to produce a mixture costing $1.60 per ounce?
20 oz

7. A health food store has a section in which you can create your own chocolate-covered fruit mixes. You choose 2 lb of the cherries that cost $4.50 per pound. You also choose blueberries that cost $3.75 per pound. How many pounds of blueberries can you add to create a mixture that costs $4.25 per pound?
1 lb

8. Find the cost per ounce of a mixture of 200 oz of a cologne that costs 47.50 per ounce and 500 oz of a cologne that cost $4.00 per ounce.
$5.00

9. How many kilograms of hard candy that costs $7.50 per kilogram must be mixed with 24 kg of jelly beans that cost $3.25 per kilogram to make a mixture that cost $4.50 per kilogram?
10 kg

10. A grocery store offers a cheese sampler that includes a pepper cheddar cheese that costs $16 per kilogram and Pennsylvania jack that costs $6 per kilogram. How many kilograms of each were used to make a 5-kilogram mixture that cost $9 per kilogram?
1.5 kg of pepper cheese, 3.5 kg of Pennsylvania Jack

11. A snack food is made by mixing 5 lb of popcorn that costs $0.80 per pound with caramel that costs $2.40 per pound. How much caramel is needed to make a mixture that costs $1.40 per pound?
3 lb

12. A lumber company combined oak wood chips that cost $3.10 per pound with pine wood chips that cost $2.50 per pound. How many pounds of each were used to make an 80 lb mixture costing $2.65 per pound?
20 lb of oak chips; 60 lb of pine chips

13. The manger of a farmer's market has 500 lb of grain that costs $1.20 per pound. How many pounds of meal costing $0.80 per pound should be mixed with the 500 lb of grain to produce a mixture that costs $1.05 per pound?
300 lb

14. A caterer made an ice cream punch by combining fruit juice that costs $4.50 per gallon with ice cream that costs $6.50 per gallon. How many gallons of each were used to make 100 gal of punch costing $5 per gallon?
Fruit Juice: 75 gal; Ice Cream: 25 gal

15. The manager of a specialty food store combined almonds that cost $4.50 per pound with walnuts that cost $2.50 per pound. How many pounds of each were used to make a 100 lb mixture that costs $3.24 per pound?
Almonds: 37 lb; Walnuts: 63 lb

16. Find the cost per pound of a "house blend" of coffee that is made from 12 lb of Central American coffee that costs $8 per pound and 30 lb of South American coffee that costs $4.50 per pound.
    $5.50

17. Find the cost per pound of sugar-coated breakfast cereal made from 40 lb of sugar that costs $2.00 per pound and 120 lb of corn flakes that cost $1.20 per pound.
    $1.40

18. Find the cost per ounce of a gold alloy made from 25 oz of pure gold that costs $482 per ounce and 40 oz of an alloy that costs $300 per ounce.
    $370

19. Find the cost per ounce of a sunscreen made from 100 oz of a lotion that costs $2.50 per ounce and 50 oz of a lotion that costs $4.00 per ounce.
    $3

20. How many liters of a blue dye that costs $1.60 per liter must be mixed with 18 L of anil that costs $2.50 per liter to make a mixture that costs $1.90 per liter?
    36 L

21. Forty ounces of a 30% gold alloy are mixed with 60 oz of a 20% gold alloy. Find the percent concentration of the resulting gold alloy.
    24%

22. One hundred ounces of juice that is 50% tomato juice are added to 200 oz of a vegetable juice that is 25% tomato juice. What is the percent concentration of tomato juice in the resulting mixture?
    $33\dfrac{1}{3}\%$

23. How many gallons of a 15% acid solution must be mixed with 5 gal of a 20% acid solution to make a 16% acid solution?
    20 gal

24. How many pounds of a chicken feed that is 50% corn must be mixed with 400 lb of a feed that is 80% corn to make a chicken feed that is 75% corn?
    80 lb

25. A rug is made by weaving 20 lb of yarn that is 50% wool with a yarn that is 25% wool. How many pounds of the yarn that is 25% wool must be used if the finished rug is to be 35% wool?
    30 lb

26. Five gallons of a dark green latex paint that is 20% yellow paint are combined with a lighter green latex paint that is 40% yellow paint. How many gallons of the lighter green paint must be used to create a green paint that is 25% yellow paint?
    $1\dfrac{2}{3}$ **gal**

27. How many gallons of a plant food that is 9% nitrogen must be combined with another plant food that is 25% nitrogen to make 10 gal of a plant food that is 15% nitrogen?
6.25 gal

28. A chemist wants to make 50 ml of a 6% acid solution by mixing a 13% acid solution and an 18% acid solution. How many milliliters of each solution should the chemist use?
13% solution: 20 ml; 18% solution: 30 ml

29. Five grams of sugar are added to a 45-gram serving of a breakfast cereal that is 10% sugar. What is the percent concentration of sugar in the resulting mixture?
19%

30. Thirty ounces of pure silver are added to 50 oz of a silver alloy that is 20% silver. What is the percent concentration of the resulting alloy?
50%

31. To make the potpourri mixture sold at a florist shop, 70 oz of a potpourri that is 80% lavender are combined with a potpourri that is 60% lavender. The resulting potpourri is 74% lavender. How much of the potpourri that is 60% lavender is used?
30 oz

32. The manager of a garden shop mixes grass seed that is 40% rye grass with 40 lb of grass seed that is 60% rye grass to make a mixture that is 56% rye grass. How much of the 40% rye grass is used?
10 lb

33. A hair dye is made by blending a a 7% hydrogen peroxide solution and a 4 hydrogen peroxide solution. How many milliliters of each are used to make a 300-milliliter solution that is 5% hydrogen peroxide?
7% solution: 100 ml; 4% solution: 200 ml

34. At a cosmetics company, 40 L of pure aloe cream are mixed with 50 L of a moisturizer that is 64% aloe. What is the percent concentration of aloe in the resulting mixture?
80%

35. How many ounces of pure chocolate must be added to 150 oz of chocolate topping that is 50% chocolate to make a topping that is 75% chocolate?
150 oz

36. How may ounces of pure bran flakes must be added to 50 oz of cereal that is 40% bran flakes to produce a mixture that is 50% bran flakes?
10 oz

37. A hair stylist combines 12 oz of shampoo that is 20% conditioner with an 8-oz bottle of pure shampoo. What is the percent concentration of conditioner in the 20-oz mixture?
12%

38. A clothing manufacturer has some pure silk thread and some thread that is 85% silk. How many kilograms of each must be woven together to make 75 kg of cloth that is 96% silk?
Pure silk thread: 55 kg; 85% silk thread: 20 kg

39. How many ounces of died apricots must be added to 18 oz of a snack mix that contains 20% dried apricots to make a mixture that is 25% dried apricots?
1.2 oz

40. A recipe of a rice dish calls for 12 oz of a rice mixture that is 20% wild rice and 8 oz of pure wild rice. What is the percent concentration of wild rice in the 20 oz mixture?
52%

41. Find the cost per ounce of a mixture of 30 oz of an alloy that costs $4.50 per ounce, 40 oz of an alloy that costs $3.50 per ounce, and 30 oz of an alloy that costs %3.00 per ounce.
$3.65

42. A grocer combined walnuts that cost $2.60 per pound and cashews that cost $3.50 per pound with 20 lb of peanuts that cost $2.00 per pound. Find the amount of walnuts and the amount of cashews used to make that 50 lb mixture costing $2.72 per pound.
Walnuts: 10 lb; Cashews: 20 lb

43. How many ounces of water evaporated from 50 oz of a 12% salt solution to produce a 15% salt solution?
10 oz

44. A chemist mixed pure acid with water to make 10 L of 30% acid solution. How much pure acid and how much water did the chemist use?
Pure Acid: 3 L; Water 7 L

45. How many grams of pure water must be added to 50 g of pure acid to make a solution that is 40% acid?
75 g

46. A radiator contains 15 gal of a 20% antifreeze solution. How many gallons must be drained from the radiator and replaced by pure antifreeze so that the radiator will contain 15 gal of a 40% antifreeze solution?
3.75 gal

47. Tickets to a performance by the community theater cost $5.50 for adults and $2.75 for children. A total of 120 tickets were sold for $563.75. How many adults and how many children attended the performance?
85 adults, 35 children

Uniform Motion Problems
1. Two planes start from the same point and fly in opposite directions. The first plane is flying 25 mph slower than the second plane. In 2 hrs, the planes are 470 miles apart. Find the rate of each plane.
105 mph; 130 mph

2. Two cyclists start from the same point and ride in opposite directions. One cyclist rides twice as fast as the other . In 3 hrs, they are 81 miles apart. Find the rate of each cyclist.
9 mph; 18 mph

3. One speed skater starts across a frozen lake at an average speed of 8 meters per second. Ten seconds later, a second speed skater starts form the same point and skates ai the same direction at an average speed to 10 meters per second. How many seconds after the second skater starts will the second skater over take the first skater?
40 s

4. A long-distance runner started on a course running at an average speed of 6 mph. Half an hour later, a second runner began the same course at an average speed of 7 mph. How long after the second runner starts will the second runner overtake the first runner?
3 hrs

5. A 555-mile, 5-hour plane trip was flown at two speeds. For the first part of the trip, the average speed was 105 mph. For the remainer of the trip, the average speed was 115 mph. How long did the plane fly at each speed?
2 hrs at 105 mph; 3 hrs at 115 mph

6. An executive drove from home at an average speed of 30 mph at an air port where helicopter was waiting. The executive boarded the helicopter and flew to the corporate offices at an average speed of 60 mph. The entire distance was 150 miles. The entire trip took 3 hrs. Find the distance from the airport to the corporate offices.
120 miles

7. Michael Chan leaves a dock in his motorboat and travels at an average speed of 9 mph toward the Isle of Shoals, a small island off the coast of Massachusetts. Two hours later, a tour boat leaves the same dock and travels at an average speed of 18 mph toward the same island. How many hours after the tour boat leaves will Michael's boat be alongside the tour boat?
2 hrs

8. After a sailboat had been on the water for 3 hrs, a change in the wind direction reduced the average speed of the boat by 5 mph. The entire distance sailed was 57 miles. The total time spent sailing was 6 hrs. How far did the sailboat travel in the first 3 hrs?
36 miles

9. A car and a bus set out at 3 P.M. from the same point headed in the same direction. The average speed of the car is twice the average speed of the bus. In 2 hrs, the car is 68 miles ahead of the bus. Find the rate of the car.
68 mph

10. A passenger train leaves a train depot 2 hrs after a freight train leaves the same depot. The freight train is traveling 20 mph slower than the passenger train. Find the rate of each train if the passenger train overtakes the freight train in 3 hrs.
Passenger train: 50 mph; Freight train: 30 mph

11. A stunt driver was needed at the production site of a Hollywood movie. The average speed of the stunt driver's flight to the site was 150 mph, and the average speed of the return tip was 100 mph. Find the distance of the round trip if the total flying times was 5 hrs.
600 miles

12. A ship traveling east at 25 mph is 10 miles form a harbor when another ship leaves the harbor traveling east at 35 mph. How long does it take the second ship to catch up to the first ship?
1 hr

13. At 10 A.M. a plane leaves Boston, Massachusetts, for Seattle, Washington, a distance of 3000 miles. One hour later a plane leaves Seattle for Boston. Both planes are traveling at a speed of 500 mph. How many hours after the plane leaves Seattle will the planes pass each other?
2.5 hrs

14. A car traveling 48 mph overtake a cyclist who, riding at 12 mph, had a 3-hour head start. How far from the starting point does the car overtake the cyclist?
48 miles