1. Rose took a half hour to row 3 km with the current. When she returned, she took 90 minutes. Find her rowing rate and the speed of the current.
2. How many liters of water must be added to 20 L of a solution that is 45% alcohol to obtain a solution that is 30% alcohol?
3. How many pounds of nuts costing $2.50 per pound should be mixed with 2 pounds of nuts costing $4.50 per pound to obtain a mixture costing $3.00 per pound?
4. At the same time Henry leaves Los Angeles for San Francisco, Christy leaves San Francisco for Los Angeles. The distance between the two cities is 380 miles. Christy’s average speed is 9 miles per hour faster than Henry’s speed. How fast is Henry driving if they pass each other in 4 hours?
5. Farmer Brown drives to town at 36 mph and returns at 48 mph. If his total driving time is 3.5 hours, how far is his home from town?
6. Twenty-five years ago, Hailey was five more than one-third as old as Jason was. Today, Jason is twenty-six less than two times the age of Hailey. How old is Jason?
7. Kayla would be one-half as old as Nathan if Kayla were four years older. Nathan is eight less than three times as old as Kayla. How old is Nathan?
8. Flying to California with a tailwind a plane averaged 158 km/h. On the return trip the plane only averaged 112 km/h while flying back into the same wind. Find the speed of the wind and the speed of the plane in still air.
9. Ann is 2 years older than Betty. Last year Ann was 2 times as old as Betty was then. How old is Ann?
10. Jerry is 7 years older than Jennifer. In three years Jerry will be twice as old as Jennifer will be. Find their current ages.
11. Last weekend two college students were returning to school 200 miles away. During a blizzard, they were only able to average 25 miles per hour. For the rest of their trip, they averaged 55 miles per hour. If the entire trip took 4 hours, how long were they driving in the blizzard?
12. The wind is blowing at 60 km/h. With a tail wind, a light plane can fly a certain distance in 2 hours. With a head wind, it takes the plane 3 hours to cover the same distance. Find the speed of the plane in still air and the distance of the plane’s flight.
13. John’s father is 5 times older than John and John is twice as old as his sister Alice. In two years time, the sum of their ages will be 58. How old is John now?
14. A cross country skier follows a trail to a nearby camp in 50 minutes. A snowmobile, averaging 16 miles per hour faster than the skier, starts from the same point on the trail and following the skier’s track covers the same distance in 10 minutes. What was the average speed of the snowmobile?
15. The sum of the ages of a man and his son is 82 years. How old is each now if 11 years ago, the man was twice his son’s age?
16. A passenger jet took 90 minutes to fly 900 miles in the direction of the jet stream. The return trip against the jet stream took 2 hours. What was the jet’s speed? What was the jet stream’s speed?
17. A boat travels 4 km in 20 minutes with the current. The return trip takes 24 minutes. Find the speed of the current and the speed of the boat in still water.
18. A fruit company mixes pineapple juice that sells for $5.50 per gallon with 100 gallons of orange juice that sells for $3.00 per gallon. How much pineapple juice is used to make a pineapple-orange juice drink selling for $3.50 per gallon?
19. A train travels through the mountains at an average speed of 35 miles per hour. It then continues on flat land at an average speed of 85 miles per hour. If the entire trip covers 1200 miles and each leg of the trip takes the same number of hours, how many miles is each leg?
20. How many liters of whole milk containing 3.5% butterfat must be mixed with 3 liters of skim milk (containing no butter fat) to obtain a mixture containing 2% butterfat?
21. A meat market manager mixes hamburger having 30% fat content with hamburger that has 10% fat content in order to obtain 400 pounds of hamburger with 25% fat content. How much hamburger of each type should the manager use?
22. On the first part of a 27.5 mile trip, the average speed was 48 miles per hour. Later, due to traffic, the average speed was reduced to 35 miles per hour. If one spent five times as long on the first part as the second part, what is the total time of the trip?
23. A car radiator has a capacity of 8 quarts of coolant which is 20% antifreeze. A mechanic needs to drain part of the radiator fluid and replace it with 100% antifreeze to bring the coolant in the system to 60% antifreeze. How much of the original coolant should be drained and replace by 100% antifreeze to achieve the desired mix?
24. A nursery has one kind of grass seed selling at 75 cents per pound and another kind of grass seed selling at $1.10 per pound. How many pounds of each kind should be mixed to produce 50 pounds of a mixture of seed that will sell for 90 cents per pound?
25. An Amtrak train leaves Las Vegas heading west toward Los Angeles. At the same time, 272 miles away, a bus leaves Los Angeles traveling east along the same route towards Las Vegas. If the train averages 31 miles per hour faster than the bus and they pass each other in 2 hours, what are the average speeds of the train and the bus?
26. A helicopter travels 20 miles per hour faster than a speeding car. The car had a half hour head start, and both traveling the same route. If the helicopter overtakes the car in 1.5 hours, what is the speed of each?
27. A man is 25 years older than his son. Fourteen years from now the man will be twice as old as his son will be. What are the present ages of the man and his son?
28. A vending machine accepts nickels, dimes and quarters. When the coins are emptied, the total value of the coins is found to be $24.15. Find the number of coins of each kind in the box, if there are twice as many nickels as quarters and 5 more dimes than nickels.
29. A fitness center usually needs three times as many $5 bills as $10 bills to transact its daily business. If the cash register contains $750 in fives and tens at the beginning of a business day, how many of each bill does the register contain?