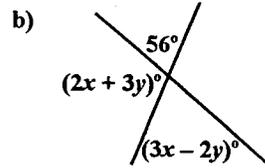
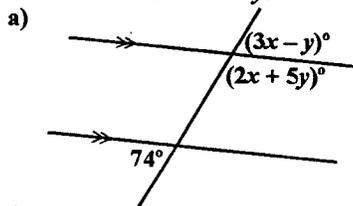


## MPM 2DI – Solving Problems Using Linear Systems

1. The sum of 2 numbers is 249. Twice the larger plus 3 times the smaller is 591. Find the numbers.
2. When 6 times the larger of 2 numbers is added to 7 times the smaller, the result is 114. Ten times the larger less 9 times the smaller is 66. Find the numbers.
3. The difference in 2 numbers is 92. When the larger is subtracted from 4 times the smaller, the result is 151. Find the numbers.
4. Charlie's father is 3 times as old as he is. In six years, the sum of their ages will be 68. How old are Charlie and his father?
5. If you double Alex's age and then subtract 6, you have Mitch's age. Two years ago, the sum of their ages was 29. How old are Alex and Mitch?
6. The perimeter of a field is 64m. Seven times the length plus five times the width is ten times the length. What are the dimensions of the field?
7. The rectangle to the side has an area of  $b$  square units and a perimeter of  $2b$  units. What is the value of  $a$ ?



8. Find the values of  $x$  and  $y$ :



9. Mike has \$300 made up of \$5 and \$10 bills. If there are 39 bills in all, how many \$5 bills does he have?
10. Emily has twice as many \$2 coins as \$5 bills. Together, they total \$153. How many \$2 coins does she have?
11. The phys-ed department bought a total of 29 basketballs and footballs at a total cost of \$1523. If the basketballs cost \$47 each, and the footballs cost \$55 each, how many of each were bought?
12. KRT bought chips for 25¢ a bag and pop for 30¢ a can. The total bill was \$155. During lunches, chips sold for 35¢ a bag and pop for 40¢ a can. After all the pop and chips were sold, KRT realized a profit of \$55. How many cans of pop were sold?
13. Paula invested \$1000, part at 8% per annum and the remainder at 9% per annum. After one year, the total interest from these investments was \$84. How much did she invest at each rate?
14. Matt needed to borrow \$8000 for a business venture. Unfortunately, he couldn't borrow it all from one bank. He was able to borrow some money from one bank at a rate of 7.5% per annum, and the remainder he borrowed from another bank, at a rate of 8.25% per annum. After one year, Matt owed \$615 in interest charges to the two banks. How much did he borrow at each rate?

15. A lab technician wants to make 500kg of 28% alcohol solution by mixing 40% alcohol solution and 20% alcohol solution. How many kilograms of each type should be used?
16. Mr. Husain mixes hydrochloric acid solutions of 30% strength and 40% strength to get 100kg of hydrochloric acid solution of 34% strength. How many kilograms of each should be used?
17. How many kilograms of 9% silver alloy and 12% silver alloy should be combined to make 500kg of 10.8% silver alloy?
18. Jelly beans and mints, worth \$2.10/kg and \$2.70/kg respectively, were mixed to make 500kg of mixture, which sold for \$2.52/kg. How many kilograms of jelly beans were used?
19. Coffee that sells for \$7.20/kg is mixed with coffee that sells for \$4.80/kg to make 1200kg of coffee that will sell for \$5.60/kg. How many kilograms of each type of coffee were used?
20. A store manager mixes tea worth \$7.50/kg and tea worth \$9.50/kg to make 200kg of tea that sells for \$8.35/kg. How much of the less expensive tea was used?
21. How many kilograms of soap powder that costs \$0.80/kg should be mixed with soap powder that costs \$1.50/kg to make 20kg of a mixture of soap powder to cost \$1.01/kg?
22. Jack drove at 50km/h from Smithville to Dry Gulch. From Dry Gulch to Streetsville, he drove at 80km/h. The whole trip was 550km and took 8 hours. How long did it take him to drive from Dry Gulch to Streetsville?
23. Fred took 7 hours to drive from Cheyenne to Boothill, a total distance of 485km. He drove most of the way at 80km/h, but was slowed to 30km/h for a time by a dust storm during the trip. How many hours did he spend driving through the dust storm?
24. It took a hockey team 5 hours to travel from Titledown to Toronto, a total distance of 1320km. Part of the trip was by bus and the remainder by plane. If the bus averaged 40km/h, and the plane 600km/h, then:
  - a) how many hours were spent travelling on the bus?
  - b) what was the distance covered travelling by the plane?
25. Flying into the wind, an aircraft made a 360km trip in 2 hours. The return trip with a tail wind took 1.5 hours. What was the wind speed?
26. It took Reg 8 hours to row 40km upstream. The return trip, aided by the current, took only 5 hours. How fast did Reg row, assuming he was rowing at a constant rate?
27. An aircraft flying into the wind can make an 1100km trip in 2 hours. The same aircraft can make the same trip in 1 hour 50 minutes, if flown with the wind. What is the speed of the wind?

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- ANSWERS
1. The numbers are 156 and 93.
  2. The numbers are 12 and 6.
  3. The numbers are 173 and 81.
  4. Charlie is 14 years old & his father is 42 years old.
  5. Alex is 13 years old & Mitch is 20 years old.
  6.  $a = 2\frac{1}{2}$
  7. The physics department bought 9 basketballs & 20 footballs.
  8. Mike has 18 \$5 bills.
  9. Emily has 34 \$2 coins.
  10. KRT sold 350 cans of pop.
  11. Mat borrowed \$6000 at 7.5% and \$2000 at 8.25%.
  12. 300kg of 20% solution & 200kg of 40% solution.
  13. 200kg of 9% silver alloy & 300kg of 12% silver alloy.
  14. 400kg of \$7.20/kg coffee and 800kg of \$4.80/kg coffee.
  15. 150kg of jelly beans were used.
  16. 115kg of the less expensive tea were used.
  17. It took 5 hours to drive from Dry Gulch to Streetsville.
  18. 3 hours on the bus. b) 1200km on the plane.
  19. Reg rowed at a rate of 6  $\frac{1}{3}$  km/h.
  20. The wind speed was 30 km/h.
  21. The wind speed is 25 km/h.
  22. Fred spent 1  $\frac{1}{2}$  hours driving in the dust storm.
  23. 14kg of \$0.80/kg soap powder and 6kg of \$1.50/kg soap powder.
  24. 26. Flying into the wind, an aircraft made a 360km trip in 2 hours. The return trip with a tail wind took 1.5 hours. What was the wind speed?
  25. It took Reg 8 hours to row 40km upstream. The return trip, aided by the current, took only 5 hours. How fast did Reg row, assuming he was rowing at a constant rate?
  26. An aircraft flying into the wind can make an 1100km trip in 2 hours. The same aircraft can make the same trip in 1 hour 50 minutes, if flown with the wind. What is the speed of the wind?