## 1.5 Solve Problems using Linear Systems

### A Algorithm to Solve Problems using Linear Systems

1. Read the question carefully
2. Make diagram if necessary
3. Assigned variables to each quantity involved ($x$, $y$, etc)
4. Read the problem again and write down linear relations between these variables
5. Solve the system of linear equations by using a convenient method
6. Check your results against the conditions stated in the original problem
7. Read the question again and write down a conclusion statement

### B (Numbers)

Ex 1. The sum of two numbers is 134, and their difference is 28. Find the numbers.

### C (Coins)

Note. Here are the values of the Canadian coins:

| | | |
|---|---|---|
| Penny = \$0.01 | Nickel = \$0.05 | Dime = \$0.10 |
| Quarter = \$0.25 | Loonie = \$1 | Toonie = \$2 |

Ex 2. Bill has \$2.95 in dimes and quarters. There are 22 coins altogether. How many of each does he have?

**D (Digits)**

Ex 3. The sum of the digits of a two-digit number is 15. The number formed by interchanging the digits is 27 more than the original number. What is the original number?

**E (Investments)**

Ex 4. Jane invested $1500, part at 5% per annum and the rest at 9% per annum. After one year the total interest earned was $103. How much did she invest at each rate?

**F (Trips)**

Ex 5. Raymond motorboat makes 60 km upstream in 5 hours. The return trip takes 3 hours. What is the speed of the motorboat relative to the water, and what is the speed of the current?

**G (Solutions)**

Ex 6. A 20% sugar solution is added to an 80% sugar solution to create 2400 mL of a 40% sugar solution. How much 20% sugar solution is used?

**H (Alloys)**

Ex 7. A metal alloy is 25% cooper. Another metal alloy is 50% copper. How much of each should be used to make 1000 g of an alloy that is 40% copper?

**I (Ages)**

Ex 8. At this moment, Sami' age is three times as much as Mashal' age. In 4 years, Sami' age will be two times as much as Mashal' age. How old are Sami and Mashal now?

**Reading**: Textbook Pages 42-45
**Homework**: Textbook Page 45-47 # 3, 4, 7, 9, 12, 14, 15, 18, 20


 