

Problem

- a) I have two digits, I am less than 30, and both 8 and 4 divide me evenly (exactly). The sum of my digits is greater than 6. Who am I?
- b) I am greater than 30 but less than 50, and both 7 and 2 divide me evenly. Who am I?

Extensions:

1. I have three digits whose sum is 12. I am less than 200, and evenly divisible by 11. Who am I?
2. Make up your own number clue question. Then find a partner and challenge one another to make sure your clues actually do lead to the number you think they should. Exchange problems with other classmates.

Hints**Part a)**

Hint 1 - What does "divide me evenly" mean?

Hint 2 - Do you have to check divisibility by both 4 and 8? Why/or why not?

Part b)

Hint 1 - If a number has both 2 and 7 as factors, what other number must also be a factor?

Suggestion: Students may approach these problems in different ways, the simplest of which is to write down all the multiples of 4 and 8 in part a), and of 7 and 2 in b). It would perhaps be worthwhile to do a) together as a class, and discuss why the desired number need only be divisible by 8.

Solution

- a) The only two-digit numbers less than 30 and divisible by both 4 and 8 are 16 and 24. Since the sum of the two digits must be greater than 6, the number must be 16.
- b) The only number greater than 30 and less than 50, divisible by both 7 and 2 (i.e., by 14) is 42.

Extension:

The three-digit multiples of 11 which are also less than 200 are 110, 121, 132, 143, 154, 165, 176, 187, and 198. The one with digits having a sum of 12 is 165.