

We have seen that we can use algebraic expressions as formulas that summarize how to compute a value (e.g., the number of toothpicks in a pattern) or a score (e.g., the straight, far travels of a car).

Since these expressions use variables, they allow us to make *general* statements that have meaning even when specific information such as a known number might be absent.

A group of highly secretive individuals were unwilling to reveal their ages, but were willing to share the following relationships between their ages:

Martine: "I am m years old."

Ralph: "I am $m - 3$ years old."

Patrice: "I am $2m - 7$ years old."

Alex: "I am $m + 5$ years old."

1. Name two of these people where you can claim with certainty that one is older than the other. You are *certain* if they are older no matter what age (m) Martine is.

(a) _____ must be older than (b) _____ .

Person a is _____ years older than person b .

2. Name two more people (at least one different) where you can claim with certainty that one is older than the other:

(a) _____ must be older than (b) _____ .

Person a is _____ years older than person b .

3. Alex claims, "I am the oldest one of the four of us." Find an age for Martine (a value for m) that makes this claim true. Experiment. Try different possibilities.

4. Patrice claims, "I am the oldest one of the four of us." Find an age for Martine (a value for m) that makes this claim true. Experiment. Try different possibilities.

The group goes to their doctor together for an annual checkup.
The doctor asks, “How much do you weigh?” and gets the following replies.

Walter: “I weigh w kilograms.”

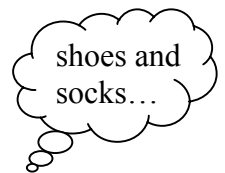
Patrice: “I weigh $\frac{1}{2}w + 30$ kilograms.”

Alex: “I weigh $2w + 5$ kilograms.”

Martine: “I weigh $w + 20$ kilograms.”

Philip: “I weigh $w - 4$ kilograms.”

1. How much does Philip weigh if Walter weighs 42 kilograms?
2. How much does Walter weigh if Martine weighs 76 kilograms?
3. How much more does Martine weigh than Philip in all cases?
4. How much does Alex weigh if Walter weighs 15 kilograms?
5. How much does Walter weigh if Alex weighs 69 kilograms?



6. Is it possible for Walter to be the heaviest? Why or why not (justify your claim with an English sentence).



7. Is it possible for Alex to be the heaviest? Why or why not (justify your claim).

8. Is it possible for Patrice to be the heaviest? Why or why not (justify your claim).

9. Is it possible for Patrice to be the lightest? Why or why not (justify your claim).

Challenge: Patrice and Philip weigh the same amount. How much does each person weigh?