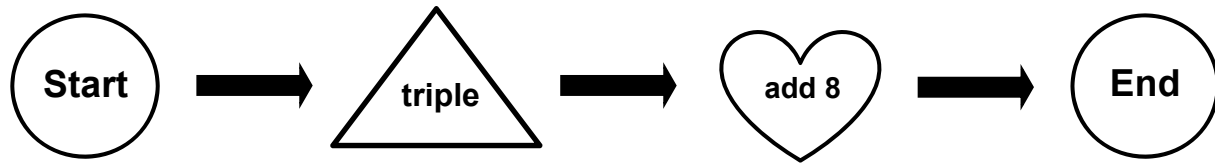


14. Number Ninja 3

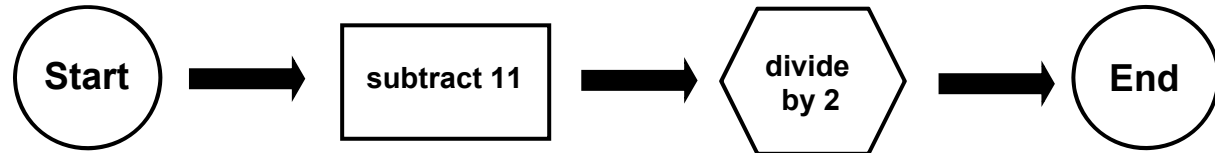
1. For the sequence of operations below, if you start with 10 you end with 38.



a. If you start with 16, you end with what number?

b. If you end with 14, you start with what number?

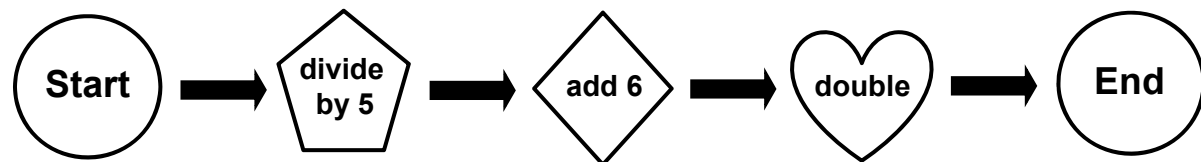
2. For the sequence of operations below, if you start with 41 you end with 15.



a. If you start with 77, you end with what number?

b. If you end with 5, you start with what number?

3. For the sequence of operations below, if you start with 30 you end with 24.



a. If you start with 70, you end with what number?

b. If you end with 32, you start with what number?

Answers

14. Number Ninja 3 (p. 17)

1a. 56

Tripling 16 gives 48. Adding 8 to 48 gives 56.

1b. 2

Work backwards from end to start. If adding 8 to a number gives 14, then the number is $14 - 8 = 6$. Continuing to work backwards, if tripling a number gives 6 then the number must be $6 \div 3 = 2$. So the starting number is 2. Confirm this by moving from start to end: tripling 2 gives 6, and adding 8 to 6 gives 14.

2a. 33

Subtracting 11 from 77 gives 66. Dividing 66 by 2 gives 33.

2b. 21

Work backwards from end to start. If dividing a number by 2 gives 5, then the number is $5 \times 2 = 10$. Continuing to work backwards, if subtracting 11 from a number gives 10 then the number must be $10 + 11 = 21$. So the starting number is 21. Confirm this by moving from start to end: subtracting 11 from 21 gives 10, and dividing 10 by 2 gives 5.

3a. 40

Dividing 70 by 5 gives 14. Adding 6 to 14 gives 20. Doubling 20 gives 40.

3b. 50

Work backwards from end to start. If doubling a number gives 32, then the number must be 16. Continuing to work backwards, if adding 6 to a number gives 16 then the number must be $16 - 6 = 10$. Going backwards one more time, if dividing by 5 gives 10 then the number must be $10 \times 5 = 50$. Confirm this by moving from start to end: dividing 50 by 5 gives 10. Adding 6 to 10 gives 16. Doubling 16 gives 32.