

1. NCTM Dec/Jan 2014/15 #11

Given

$$f(x) = x + 3$$

$$g(x) = ax^2 + bx + c$$

$$g(f(x)) = 2x^2 + 7x + 6,$$

find  $a + b + c$ .

2. NCTM March 2019

(There are two ways to solve this problem and maybe more than two. One way to solve this requires the given information that  $x$  is a prime integer less than 1000.

The second way does not require that given information.)

Solve for  $x$ :

$$\sqrt{x+8} + \sqrt{x-32} = 20.$$

3. NCTM April 2018 #24

Given  $6 < \sqrt{a} < 7$ . Find an integer  $n$  such that  $n < \sqrt[3]{a} < (n+1)$ . Can you do this without a calculator?