

# Operators

One to One Tutoring

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1. Define  $f(a, b, c, d) = ad - bc$ . For what values of  $x$  is  $f(x, 2x, 3, 1) = 3$ .
2. Define  $a\#b = \frac{a+b}{a-b}$ . What is  $(3\#2)\#1$ ?
3. For any positive integer  $n$ ,  $\tau(n)$  is the number of positive integer divisors of  $n$  which are greater than 3. Which is larger,  $\tau(12)$  or  $\tau(34)$ ?
4. The function  $clock(t)$  takes a time in minutes,  $t$ , and gives you the number of hours in  $t$  minutes, rounding to the nearest hour. For example, 63 minutes is 1 hour and 3 minutes, so  $clock(61) = 1$ . What is  $clock(185)$ ? If  $clock(x) = 5$ , what are all the possible values of  $x$ ?
5. Define  $a@b = ab - 1$ . Define  $x \wedge y = \frac{x}{y} - \frac{y}{x}$ . What is  $(2@3) \wedge (-1@ - 2)$ ?
6. A function is defined as follows: If  $a$  is even, then  $f(a) = a/2$ . If  $a$  is odd, then  $f(a) = \frac{a+1}{2}$ . What is  $f(f(f(18)))$ ?