

The sum of 25 consecutive even integers is 10000.  
What is the largest of them?

We have

$$2n + (2n + 2) + (2n + 4) + \dots + (2n + 48) = 10000$$

$$\underbrace{\hspace{1cm}}_{1^{\text{st}}} \quad \underbrace{\hspace{2cm}}_{2^{\text{nd}}} \quad \underbrace{\hspace{2cm}}_{3^{\text{rd}}} \quad \underbrace{\hspace{2cm}}_{25^{\text{th}}}$$

$$\Rightarrow (2n) \times 25 + (2 + 4 + \dots + 48) = 10000$$

$$\Rightarrow 50n + 2(1 + 2 + \dots + 24) = 10000$$

$$\Rightarrow 50n + 2 \cdot \frac{24 \cdot 25}{2} = 10000$$

$$\Rightarrow 50n + 50 \times 12 = 10000$$

$$\Rightarrow n + 12 = 200$$

$\Rightarrow n = 188$  is the smallest of the 25 integers

$$\Rightarrow 2n + 48 = 2 \times 188 + 48$$

$$= \boxed{424} \text{ is the largest}$$

The sum of six consecutive positive integers is 2013. What is the largest of them?

We have

$$n + (n+1) + (n+2) + (n+3) + (n+4) + (n+5) = 2013$$

$$\Rightarrow 6n + (1 + \dots + 5) = 2013$$

$$\Rightarrow 6n + \frac{5 \times 6}{2} = 2013$$

$$\Rightarrow 6n = 2013 - 15 = 1998$$

$$\Rightarrow n = 333$$

The largest of the integers is

$$n+5 = 333 + 5 = \boxed{338}$$