

A construction company offers to charge 1 cent for the first day of work. Then they offer to charge 2 cents for the following day. Then they offer to charge double that, which is 4 cents, for the following day. The whole project will take 31 days. Is this a good deal?

1) This is an example of a geometric series that is finite.

Day 1: 1 cent

Day 2: 2 cents = 2 times 1 penny

Day 3: 4 cents = 2 times 2 cents

So there is a constant ratio of 2 from day to day between the terms.

2) Therefore, at the end of the 31 days, the amount will be s

$$\text{Formula: } s = \frac{1 - r^n}{1 - r}$$

$$s = \frac{1 - 2^{31}}{1 - 2} = \frac{-2147483647}{-1} = 2147483647 \text{ cents}$$

3) To convert to dollars, divide by 100 because there are a 100 cents to a dollar.

$$\frac{2147483647}{100} = 21474836.47 \text{ or about 21 million dollars!}$$