

PRINT your Name: Solution

1. Remember that the formula for compound interest is

$$F = P \left(1 + \frac{r}{n} \right)^T$$

Suppose I put \$1000 in an account paying 6% annual interest, compounded monthly. How long until the amount in the account is at least \$1500? While you don't need to simplify logarithms, etc, you **must** state whether the time you give is in days, months, or years.

Solution: We need to solve for T , which is in the same time units as the compounding, so it will be in months. First, we fill in F (1500), P (1000), r (.06), and n (12).

$$1500 = 1000 \left(1 + \frac{.06}{12} \right)^T$$

Now divide out the 1000, and simplify $1 + .06/12$:

$$1.5 = (1.005)^T$$

Take the logarithm of both sides, and remember that $\log(a^b) = b \log a$:

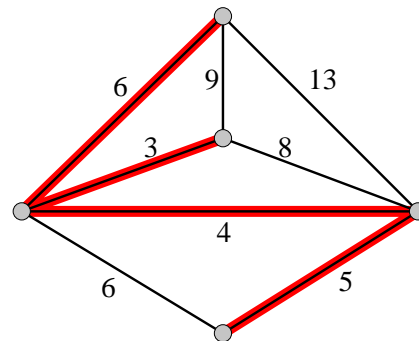
$$\log(1.5) = T \log(1.005)$$

Divide to get T :

$$T = \frac{\log 1.5}{\log(1.005)} \approx 81.296 \text{ months,}$$

or just over 6 years and 9 months.

2. Find the minimal spanning tree for the the weighted graph below.



Solution:

To do this, we use Prim's algorithm. First, we mark the edge with the smallest weight (3). Then we take the next smallest weight connected to the already marked edges (4). Then again the smallest connected (5). Finally, we take the (6) which connects the top vertex.