



Problem of the Week

Problem B and Solution

Money for Music

Problem

The CEMCers are a new up-and-coming band. They only play music that they have written. Over the past year, they had to cancel a few concerts. They will try to recover some of the money lost by using the online radio station RipRap.

- (a) On the streaming radio station RipRap, musicians are paid on average \$0.0038 every time one of their songs is played. If The CEMCers usually make around \$10 000 per concert, how many times will RipRap have to play one of their songs for The CEMCers to make an income equivalent to the income made in one concert?
- (b) Riprap doesn't play an artist's songs non-stop, all day, every day. Suppose that RipRap plays one of The CEMCers songs three times every day, starting on January 1, 2022. How long will it take until RipRap has paid \$10 000 to The CEMCers? (To take leap years into account, assume each year has 365.25 days.)

Solution

- (a) The desired relationship is

$$\$10\,000 = \text{the number of plays of their songs} \times \$0.0038$$

Thus, the required number of plays is

$$10\,000 \div 0.0038 \approx 2\,631\,578.95$$

Since a whole number of songs are played, The CEMCers will have made the income made in one concert once RipRap has played one of their songs 2 631 579 times.

- (b) The number of days needed to play 2 631 579 of an artist's songs at 3 plays per day is

$$2\,631\,579 \div 3 = 877\,193 \text{ days}$$

Assuming each year averages 365.25 days, this is equivalent to

$$877\,193 \div 365.25 \approx 2401.6235 \text{ years}$$

That is, it would take 2401 years plus approximately $0.6235 \times 365.25 \approx 228$ days to play enough songs to pay the artist \$10 000.

This would be in the year 4423. It looks like The CEMCers will need to find another source of income to make up for their lost income.

EXTENSION: How many plays a day would result in the band earning \$10 000 in 20 years?