

Applications of Two-Step Solving

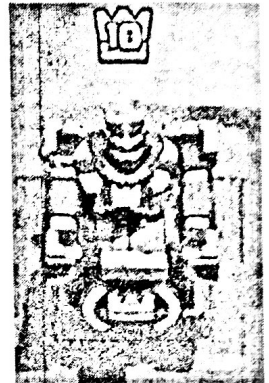
MFM2P

Mr. Smith is currently at level 10 on his Clash Royale account. This means his King tower has 4392 hitpoints. His opponent has played a level 7 Hog Rider, that does 176 points of damage every second.

An equation that would model the health of Mr. Smith's King tower is...

$$H = 4392 - 176t$$

Where H is the amount of hit points his tower has, and t is the number of seconds that the Hog Rider attacks for.



a) If the hog rider attacks for 6 seconds, how many hit points will Mr. Smith's King tower have left?

$$t = 6 \quad H = ? \quad H = 4392 - 176(6)$$

$$H = 3,336 \text{ hit points left}$$

b) In another game, a similar hog rider got Mr. Smith's King tower down to 3600 hit points. How many seconds did the Hog rider attack for?

$$H = 3600 \quad t = ?$$

$$3600 = 4392 - 176t$$

$$\begin{array}{r} -4392 \\ \hline -792 = -176t \\ \hline -176 \quad -176 \\ \hline 4.5 = t \end{array}$$

c) If left uncontested, how many seconds would it take the Hog rider to destroy Mr. Smith's King tower (reduce its hit points to 0)?

$$H = 0 \quad t = ?$$

$$0 = 4392 - 176t$$

$$\begin{array}{r} -4392 \\ \hline -4392 = -176t \\ \hline -176 \quad -176 \\ \hline 25 = t \end{array}$$

d) When Mr. Smith hits level 11, his King tower will have 4824 hit points. How would the original equation change?

$$H = 4824 - 176t$$

e) In a new game, a bandit is attacking Mr. Smith's level 10 King tower. The bandit does 193 damage per second. How would the original equation change?

$$H = 4392 - 193t$$

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You try it:

Bort is filling up a pool in his backyard. The pool currently has 2,500 L of water in it. He can fill it at a rate of 12L every minute. An equation modeling the amount of water in the pool when he starts filling is...

$$W = 2,500 + 12m$$



Where W is the amount of water in the pool (in L), and m is the number of minutes the hose is on.

The pool will be full when there is 9,200 L of water in it. How long will this take? Use your equation!

$$\begin{array}{r} 9,200 = 2,500 + 12m \\ -2,500 \quad -2,500 \end{array}$$

$$\frac{6700}{12} = \frac{12m}{12}$$

$$558.3 = m$$

→ 558 minutes or 9.3 hours.