

# MATHCOUNTS 2015–2016 HB Poster Problem

**MATHCOUNTS**<sup>®</sup>  
FOUNDATION

**ALLIE** STARTS SKIING DOWNHILL,  
PASSING A FLAG EVERY **6 SECONDS**.

SIX SECONDS LATER, **ALEX** FOLLOWS,  
SNOWBOARDING PAST A FLAG  
EVERY **5 SECONDS**.

AFTER HOW MANY SECONDS  
WILL **ALEX** REACH **ALLIE**?



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Get the solution at [www.mathcounts.org/poster](http://www.mathcounts.org/poster)

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## MATHCOUNTS 2015–2016 HB Poster Problem Solution

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**Allie** passes a flag every six seconds, and **Alex** passes a flag every five seconds. We can write equations for each of their distances since distance = rate  $\times$  time. **Alex's** distance will be  $\frac{1}{5} \times t$ , where  $t$  represents the time in seconds from when **Alex** starts skiing and the distance is measured in the number of flags passed. **Allie's** distance will be  $\frac{1}{6} \times (t + 6)$ , since she has a 6 second head start on **Alex**. To find when **Alex** will reach **Allie**, we can set the two expressions to be equal and solve for  $t$ .

$$\left(\frac{1 \text{ flag}}{5 \text{ seconds}}\right) \times t \text{ seconds} = \left(\frac{1 \text{ flag}}{6 \text{ seconds}}\right) \times (t + 6) \text{ seconds}$$

$$\frac{t}{5} = \frac{t + 6}{6}$$

$$\frac{1}{5}t = \frac{1}{6}t + 1$$

$$\left(\frac{1}{5} - \frac{1}{6}\right)t = 1$$

$$\frac{1}{30}t = 1$$

$$t = 30$$

**Alex** will reach **Allie** after **30** seconds.

Another way to solve this problem is to use a table to show distance verses time. Measuring time from when **Alex** starts skiing, we can fill in the following table.

Distance (Flags)	<b>Allie's</b> Time (Seconds)	<b>Alex's</b> Time (Seconds)
1	0	5
2	6	10
3	12	15
4	18	20
5	24	25
6	30	30

We see that **Allie** and **Alex** will both be at flag number six at **30** seconds.