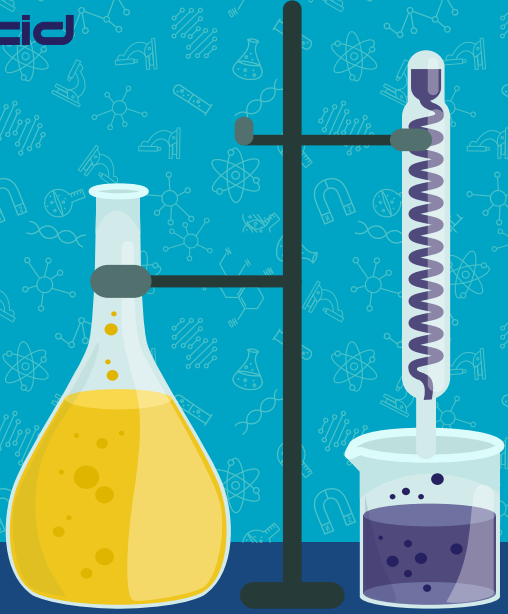


## MATHCOUNTS 2018–2019 Fall Newsletter Poster Solution

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**Purploxide is 16% acid and yellowgen is 6% acid.** Catalina adds some purploxide to 30 mL of yellowgen. What is the volume of the resulting solution if the mixture is 12% acid?



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Catalina has 30 mL of yellowgen, of which 6%, or  $(0.06)(30) = 1.8$  mL is acid. To that she adds  $p$  mL of purploxide, of which 16%, or  $0.16p$  mL is acid. The resulting yellowgen and purploxide solution has a total volume, in milliliters, of  $30 + p$ . We are told that 12%, or  $(0.12)(30 + p) = 3.6 + 0.12p$  mL of this mixture is acid. Since the 1.8 mL of acid from the yellowgen and the  $0.16p$  mL of acid from the purploxide combined make up the  $3.6 + 0.12p$  mL of acid in the mixture, we have the equation  $1.8 + 0.16p = 3.6 + 0.12p$ . Solving for  $p$ , we get  $0.04p = 1.8$ , meaning the volume of purploxide that Catalina adds is  $p = 45$  mL, and the volume of the resulting solution is  $30 + p = 30 + 45 = \mathbf{75}$  mL.