## THE HARDEST MATH PROBLEM STUDENT CONTEST

Congrats on making it to the final round of the contest! Ready to show off your math and writing skills? You could win a laptop, plus $\$ 5,000$ for college!

Use the Challenge 2 Question Sheet to answer the story problem for your grade.
Want an extra challenge? You can also answer the problem for any grade level above you!

My Grade I'm currently in grade $\quad \square 5 \quad \square 6 \quad \square 7 \quad \square 8$

## PART A: My Answer(s)

Grade 6 Problem:

Grade 7 Problem:

Grade 8 Problem:

PART B: My Reasoning Use a separate sheet of paper to explain how you arrived at your answer(s). Write your answer(s) as though you are explaining it to someone who does not understand very much about math. Be clear, detailed, and precise. Be sure to write neatly, or type your answer!

CONTACT INFORMATION

Student's First Name $\qquad$

Student's Last Name $\qquad$

Grade $\qquad$

Teacher's Name $\qquad$

Teacher's Email $\qquad$

School Phone $\qquad$

School Name $\qquad$

School Address $\qquad$

City $\qquad$

State $\qquad$ Zip Code $\qquad$

NO PURCHASE NECESSARY. 50 US, DC, and US territories. Entries must be submitted by the student's teacher, 18+. Teachers submit entries online: scholastic.com/hardestmathcontest. Teachers submit entries by mail: Scholastic Inc., The Hardest Math Contest, ATTN: SNP, Space 3-226, 557 Broadway, New York, NY 10012. Challenge 1: Open to grs. 5-8 students. Students may enter by answering at least one question at or above their current grade level. For each problem submitted, only one answer may be submitted. Use a different entry form for each answer submitted. Entry period: 12:01 a.m. ET on $9 / 25 / 20$ to $11: 59$ p.m. ET on $11 / 23 / 20$. Mailed entries: postmarked by $11 / 23 / 20$, and rec'd by $12 / 7 / 20$. Three teachers who submit at least three eligible student entries (except as set forth in official rules) will each receive a $\$ 500$ gift card. Challenge 2: Open to grs. 5-8 students who answered correctly in Challenge 1. Teachers or parents of eligible students will be notified on or around $1 / 11 / 21$. Students may enter by answering at least one question at or above their current grade level. For each problem submitted, only one answer may be submitted. Use a different entry form for each answer submitted. Entry period: 12:01 a.m. ET on 1/11/21 to 11:59 p.m. ET on 2/26/21. Mailed entries: postmarked by 2/26/21, and rec'd by 3/12/21. Three (3) Grand Prize winning students, one from each of sixth, seventh, and eighth grades problems, will each receive a laptop computer with Microsoft Office Home and Student Office products (ARV $\$ 550$ ) and a $\$ 5,000$ contribution to a 529 plan (a college savings account) (ARV $\$ 5,000$ ). The three teachers who submitted the entries of the GrandPrize Winners will each receive a $\$ 500$ American Express gift card for classroom use (ARV $\$ 500$ ). Three (3) Runner-Up winning students, one from each of sixth, seventh, and eighth grade problems, will each receive a tablet computer, which does not include a data plan (ARV $\$ 125$ ). Official Rules: scholastic.com/hardestmathcontest/rules. Void where prohibited.

## THE HARDEST MATH PROBLEM <br> GRADE 6

The leaders of the EARTH Club learned a lot from the research they collected about bees. Now they are making plans to turn the facts into action.
"I bet a lot of students don't know that honeybees pollinate about one-third of the nation's crops, but are disappearing at an alarming rate," says Maria.
"Yeah, and pesticides are a big part of the problem," adds Vishal. "The bees need our help!"
The EARTH Club decides to launch a few exciting projects at their school to create buzz about saving the bees. It's a lot of work for the EARTH Club, and they're counting on math help from their newest member-you!

## Solve the Problem

The sixth graders are making posters about Bee Colony Collapse, the mysterious disappearance of bees from their hives. Data shows that pesticides, especially chemically-made neonicotinoids may play a part. Uh-oh! Someone just spilled paint on one of their posters and they'll have to recreate it. Luckily, Vishal remembers that the last 2 data points are the same.



Maria had been analyzing the data in two parts, looking for patterns. She determined that the average number of colony collapses due to pesticides from 2007-2012 compared to the average from 2002-2007 was $1 \frac{2}{3}$ times the ratio of the averages of incidents investigated during those periods. What is the total number of colony collapses from 2002 to 2012?

## THE HARDEST MATH PROBLEM <br> GRADE 7

The leaders of the EARTH Club learned a lot from the research they collected about bees. Now they are making plans to turn the facts into action.
"I bet a lot of students don't know that honeybees pollinate about one-third of the nation's crops, but are disappearing at an alarming rate," says Maria.
"Yeah, and pesticides are a big part of the problem," adds Vishal. "The bees need our help!"
The EARTH Club decides to launch a few exciting projects at their school to create buzz about saving the bees. It's a lot of work for the EARTH Club, and they're counting on math help from their newest member-you!

## Solve the Problem

The 7th graders are planting a school garden and have decided to use only organic pesticides. They considered six products with similar ingredients that are safe for bees. Jade just finished placing their orders when-yikes!-her laptop died! And she can't remember the total amount she spent on the three bottles she ordered. Of two combinations that had the same median for increase in honey production, she ordered the one with the lower cost per ounce and was able to stay within the club budget of $\$ 120$. How much money did they spend?

| Organic Pesticides |  |  |  |
| :---: | :---: | :---: | :---: |
| Product | \% increase in honey production (per year) | Bulk cost <br> (shipped in 64 oz bottles) | Shipping cost |
| MintMix | 62\% | $\begin{gathered} \$ 34.29 / \\ \text { qt } \end{gathered}$ | \$1.15 per half-gallon |
| ZenEarthinol | 58\% | $\begin{gathered} \$ 88.50 / \\ \text { gal } \end{gathered}$ | \$2.50/ bottle |
| Mito-Down | 71\% | $\begin{gathered} \$ 130.60 / \\ 2.5 \mathrm{gal} \end{gathered}$ | \$3.50 per gallon |
| VarroAway | 99\% | $\begin{gathered} \$ 124.80 / \\ 1.5 \mathrm{gal} \end{gathered}$ | $5 \%$ of subtotal |
| Garden+ | 95\% | $\begin{gathered} \text { \$75.16/ } \\ \text { gal } \end{gathered}$ | Free |
| NoPest | 80\% | $\begin{gathered} \$ 223 / \\ 2 \mathrm{gal} \end{gathered}$ | \$.05/oz |
|  | A Program |  |  |

## THE HARDEST MATH PROBLEM GRADE 8

The leaders of the EARTH Club learned a lot from the research they collected about bees. Now they are making plans to turn the facts into action.
"I bet a lot of students don't know that honeybees pollinate about one-third of the nation's crops, but are disappearing at an alarming rate," says Maria.
"Yeah, and pesticides are a big part of the problem," adds Vishal. "The bees need our help!"
The EARTH Club decides to launch a few exciting projects at their school to create buzz about saving the bees. It's a lot of work for the EARTH Club, and they're counting on math help from their newest member-you!

## Solve the Problem

The 8th graders are volunteering to make and sell organic pesticides, called Sweet4Bees, that will protect plants in local gardens without harming bees. The teens also plan to donate some of their product to local nursing homes to use in their gardens. Jade is so excited! She's already started a business log in her notebook, including a graph with a break-even point of 34 bottles sold.

Suppose all Jade's notes become true. What is the club's overall profit per ounce of pesticide solution, when 26 bottles have been donated to the nursing homes? Round to the nearest cent.

## Sweet4Bees Business Log

Production Expenses: $\$ 1.45$ (empty bottle), \$0.05 (label), cost of ingredients (not sure right now, l'll call it \$m)

Taxes \& Fees: none!
Selling Cost: \$9.72/bottle
Start-up Expenses: \$65.88
(high-speed mixer), \$55 (pans),
\$26 (kitchenware)

- Each bottle holds 12 oz of pesticide concentrate.* Directions for preparing solution: Mix 7 parts water to 1 part Sweet4Bees concentrate to create the pesticide solution.
- When profits > $\$ 500$, for every 15 bottles sold, donate 2 bottles to local nursing homes for their gardens.


[^0]
[^0]:    *concentrate $=$ a stronger version of a liquid product, intended to be diluted with water to make its final form

