You may have been told that the SAT is hard, but how hard is it? These questions represent some of the most difficult math questions you will encounter.

1. A gift shop is going out of business. Prices for all items in the store were assigned in July. Each month after that, the price was 40% less than the price the previous month. If the price of an item was $d$ dollars for July, what was the price for October?

   (A) 0.128$d$
   (B) 0.16$d$
   (C) 0.2$d$
   (D) 0.216$d$
   (E) 0.64$d$

2. What was the initial number of students enrolled in a high school that now has $b$ students and which lost $c$ students and then gained 100 students?

   (A) $b + c + 100$
   (B) $b + c - 100$
   (C) $b - c + 100$
   (D) $b - c - 100$
   (E) $bc + 100$

3. Figure $ABCDEF$ is a regular hexagon. Line $FC$ bisects angle $AFE$. If the length of $ED$ is 12, what is the length of $FG$?

4. For $n \geq -2$, $\sqrt{n} = \sqrt{n + 2}$. Which of the following is the equivalent of $\sqrt{14} + \sqrt{34}$?

   (A) $\sqrt{10}$
   (B) $10$
   (C) $16$
   (D) $64$
   (E) $98$
SAT Math Solutions

Each of the questions is explained below.

1. A gift shop is going out of business. Prices for all items in the store were assigned in July. Each month after that, the price was 40% less than the price the previous month. If the price of an item was $d$ dollars for July, what was the price for October?

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   (B) 0.16$d$
   (C) 0.2$d$
   (D) 0.216$d$
   (E) 0.64$d$

Rather than mess with complicated formulas, assign a price to $d$ for July. Because the question involves percentages, use 100.

July item (d) = $100
40% of $100 = $40
» $100 - $40 = $60
August item = $60
40% of $60 = $24
» $60 - $24 = $36
September item = $36
40% of $36 = 14.40
» $36 - $14.40 = $21.60
October item = $21.60

Which one of the answer choices multiplied by $d$ (100) equals 21.60?
Choice (D): 0.216(100) = 21.60

2. What was the initial number of students enrolled in a high school that now has $b$ students and which lost $c$ students and then gained 100 students?

   (A) $b + c + 100$
   (B) $b + c - 100$
   (C) $b - c + 100$
   (D) $b - c - 100$
   (E) $bc + 100$

Create simple equations based on the information in the question:

Number of students now: $b$
Initial number of students = $x$

Number of students now = $x - c + 100$
b = $x - c + 100$
b + c = $x + 100$
b + c - 100 = $x$

3. Figure ABCDEF is a regular hexagon. Line FC bisects angle AFE. If the length of ED is 12, what is the length of FG?

The sum of the interior angles of a hexagon is 720. A regular hexagon has equal sides and angles, so angle AFE = 120° (720°/6 sides) and angle AFG = 60° (bisected means “cut in half”). Triangle AFG is a 30:60:90 triangle. Because ABCDEF is a regular hexagon, AF = ED = 12.

FG = 6

4. For $n \geq -2$, $\bigoplus n = \sqrt{n + 2}$. Which of the following is the equivalent of $\bigoplus 14 + \bigoplus 34$?

   (A) $\bigoplus 10$
   (B) $\bigoplus 10$
   (C) $\bigoplus 16$
   (D) $\bigoplus 64$
   (E) $\bigoplus 98$

According to the function, $\bigoplus 14 = \sqrt{14 + 2} = \sqrt{16} = 4$ and $\bigoplus 34 = \sqrt{34 + 2} = \sqrt{36} = 6$, so $\bigoplus 14 + \bigoplus 34 = 4 + 6 = 10$.

Which answer choice equals 10?

   (A) $\bigoplus 10$
   (B) $\bigoplus 10$
   (C) $\bigoplus 16$
   (D) $\bigoplus 64$
   (E) $\bigoplus 98$