

Round 1, Question 1

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Evaluate: 4×31

Round 1, Question 2

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

How long, in hours, would it take you to travel X miles at a constant speed of 16 miles per hour?

Round 1, Question 3

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Evaluate: $248 \div X$

Round 1, Question 4

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

If a and b are both positive integers and $a^b = X$, find the minimum possible sum of a and b .

Round 2, Question 1

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Solve for a : $\frac{a}{3} + 4 = \frac{a}{15} - 8$

Round 2, Question 2

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

If $\frac{X}{b} + \frac{b}{5} = 0$, what is the value of b ?

Round 2, Question 3

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Solve for c : $c^2 - 8c + X + 1 = 0$

Round 2, Question 4

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

If d is positive and $(1 - X)d^2 + 2d + 1 = 0$, what is the value of d ?

Round 3, Question 1

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Elizabeth has a rectangular piece of cardboard measuring 35 cm by 28 cm. Since brown is not a very interesting color, Elizabeth wants to cover the entire front side of the cardboard with pink rectangular sticky notes measuring 4 cm by 5 cm. What is the minimum number of sticky notes she has to use?

Round 3, Question 2

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Triangle ABC and triangle DEF are similar. Triangle ABC has an area of 2 square units, while triangle DEF has an area of $2X$ square units. If triangle ABC has a perimeter of 7 units, what is the perimeter of triangle DEF ?

Round 3, Question 3

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

A trapezoid has an area of X square units. If the trapezoid's height is 14 units and the length of one of its bases is 2 units, what is the length of the other base?

Round 3, Question 4

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

What is the area of an equilateral triangle with side length X units?

Round 4, Question 1

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

The probability of rolling a 6 two consecutive times on a heavily loaded die is 64 percent. What is the percent chance of rolling a 6 just once on this die?

Round 4, Question 2

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Sam has a 100 percent chance of answering a multiple-choice question correctly if he knows the answer. If he doesn't know the answer, he will guess, and has an X percent chance of picking the correct answer. How many questions would Sam be expected to answer correctly if he takes a 50-question test for which he only knows half of the answers?

Round 4, Question 3

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

A strange man presents you with a spinner that has an equal chance of landing in each of nine sections. One section is painted gold while the others are painted red. You must pay 1 dollar each time you spin the spinner. If the spinner lands in a red section, you win nothing; if the spinner lands in the gold section, you win 11 dollars. After X spins, what is your expected profit, in dollars?

Round 4, Question 4

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

A fair die with X sides is labeled with the numbers 1 through X . What is the probability of rolling three prime numbers in a row with this die? (The prime numbers are not necessarily different.)

Round 5, Question 1

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Andrew initially had a rectangle of gumdrops measuring 43 gumdrops by 59 gumdrops. He then used some of his gumdrops to make 15 squares measuring 13 gumdrops by 13 gumdrops. How many gumdrops did he have left over after making the squares?

Round 5, Question 2

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

Kevin's mother has locked the pantry with an electronic lock. The lock will open when the correct value of $X@2$, where the @ operation is defined by $m@n = m\sqrt{n\sqrt{m@n}}$, is entered. What number must Kevin enter into the lock to get into the pantry?

Round 5, Question 3

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

What is the surface area, in square feet, of a giant spherical meatball with a radius of $\frac{9X}{\sqrt{\pi}}$ feet?

Round 5, Question 4

General Instructions: In all questions after Question 1 of each round, the capital letter X represents the answer to the previous question. Once you solve your question, write only a numerical answer on the answer sheet; do not include units.

The word "DINNER" is repeated infinitely like so: "DINNERDINNERDINNERDINNER..." The X th letter in the series is the n th letter in the alphabet. What is the value of n ?