## From Stage 1

1. In a math contest, each contestant's test uses 12 sheets of paper, of which 9 are printed on one side only, and 3 are printed on both sides. Each sheet of paper costs 2 cents. Photocopying costs an additional 5 cents per printed side. How much does it cost to produce enough tests for 250 contestants? Please give the answer in dollars. An answer like 123.00 or 123.45 is of the right shape.

2. In a math contest, every student wrote two tests. One-half of the students wrote Tests 1 and 2, one-quarter wrote Tests 2 and 3, one-sixth wrote Tests 3 and 4, and the remaining 11 students wrote Tests 4 and 5. How many students wrote Test 2?

3. The contract of the CEO of a corporation specifies that she will be paid a bonus of 20% of the net profit, *after* that bonus is deducted. The gross profit, *before* the bonus was deducted, was $2,850,000. What is the CEO's bonus, in dollars?

4. When the positive rational numbers x and y are expressed as common fractions in lowest terms, the denominators are 126 and 180 respectively. What is the least possible denominator when $x + y$ is expressed as a common fraction?

From Stage 2

1. How many different rectangles are there whose sides are integers and whose perimeter is 98?

2. A fair coin is flipped 5 times. What is the probability that it lands heads exactly once?

3. Alfonso bought 10 identical shirts and 10 identical sweaters, paying a total of $600. A shirt costs 8 dollars less than a sweater. How much did each shirt cost?

4. What is the volume, in cubic cm, of the solid below? The solid is a box that has a hole with square cross-section drilled all the way from the front to the back. All distances in the diagram are in cm.
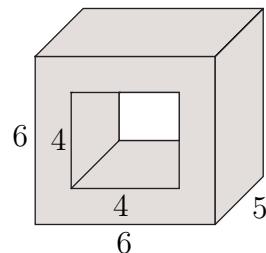
5. A box of 34 cookies is divided between A, B, C, and D. Together, A and D get 14 cookies; A, B, and C together get 28 cookies; and C and D together get 15 cookies. How many cookies does A get?

6. 66 is 120% of what number?

7. A baker sells cookies in either small boxes (6 cookies to a box) or large boxes (12 cookies to a box). At the end of the day the baker has sold 30 boxes of cookies, 210 cookies altogether. How many small boxes did the baker sell?

From Stage 3

1. What is $98 + 198 + 298 + 398 + \cdots + 998$?

2. Runner A runs at a steady 18 km per hour, while B runs at 16 km per hour. In a race, A crosses the finish line 10 minutes ahead of B. How many km was the race?

3. The hypotenuse AB of right-angled triangle ABC has length $\sqrt{13}$ metres. The sum of the lengths of the other two sides is $\sqrt{15}$ metres. How many square metres are in the area of the triangle? Express your answer as a common fraction.


From Stage 4

1. Simplify: $1 - 2 + 3 - 4 + 5 - 6 + \cdots + 99 - 100$.

2. The diagram represents a regular hexagon with perimeter 90 cm. What is the number of cm in the diagonal AB?

3. What whole number is closest to the square root of 2005?

4. Express $7\frac{1}{7}\%$ as a common fraction in lowest terms.

5. There were three candidates for Student Council president. Alicia got twice as many votes as Beti, who got twice as many votes as Chris. Altogether, 350 votes were cast. How many votes did Alicia get?

6. What is the value of $\dfrac{25.3}{0.11}$?

7. Alan went to the casino. Each time he bet, he won 1 dollar or lost 1 dollar. By the end of the evening, he had won 10 times and had a net loss of 10 dollars. How many times did Alan bet?

8. Name the smallest positive even integer which is *not* a factor of 7!.

9. If $\dfrac{1}{2x+1} = \dfrac{2}{3}$, what is $\dfrac{1}{2x+2}$?

10. How many ways are there to make change for a ten dollar bill using only pennies and/or dimes?

11. The school basketball team played 28 games. It never won more than 4 games in a row. What is the largest number of games it could have won?

12. Let $\mathcal{C}$ and $\mathcal{D}$ be two different circles. What is the largest number of common tangents that $\mathcal{C}$ and $\mathcal{D}$ can have?

13. A square is divided into 3 congruent rectangles as in the diagram. If the perimeter of any of the 3 rectangles is 12 units, what is the perimeter of the square?
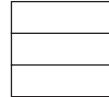
14. If $\dfrac{2}{xy} = 7$, what is $2xy$?

15. How many positive integers are factors of 1024?

16. How many three-digit numbers are there such that the three digits are not all the same?

17. Beth has 3 pennies, 4 dimes, and 5 quarters. If she loses 3 of her coins, how many different amounts of money can she lose?

18. In a certain community, 15% of households own no car, 60% own 1 cars, 20% own 2 cars, and 5% own 3 cars. How many cars are there for every 100 households?

19. The large circle has area 100 square units. The small circles are all equal, and their centers lie along two diameters of the large circle. What is the number of square units in the shaded area?
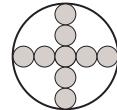
20. What is the sum of the positive integers that divide 64?