ICTM Grade School & Junior High Contests
Sample Questions with Common Core Connections

3rd Grade:

1. If $\dfrac{3}{6} = \dfrac{1}{a}$ and $\dfrac{6}{8} = \dfrac{b}{4}$, then find the value of $a + b$.

    (CCSS: Develop understanding of fractions as numbers.)

2. A rectangle has a length of 8 inches and a width of 6 inches. A smaller rectangle is cut out from the middle of the bigger rectangle. The smaller rectangle is 3 inches long and 2 inches wide. Find the area of the figure that remains.
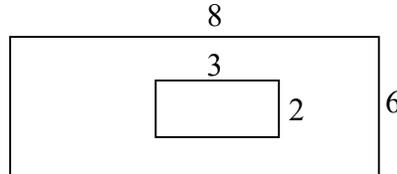
    (CCSS: Understand concepts of area and relate area to multiplication and division.)

4th Grade:

1. Gretchen charges \$7.25 per hour for babysitting. If she babysat Friday for $4\dfrac{1}{2}$ hours, Saturday for $9\dfrac{1}{2}$ hours and Sunday for 5 hours, determine the amount of money she earned over the weekend.

    (CCSS: Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.)

2. Find the measure of the missing angle.
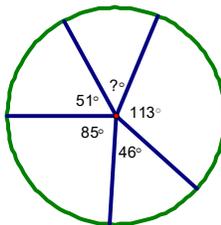
    (CCSS: Geometric measurement: understand concept of angle and measure angles.)

5th Grade:

1. A cookie recipe requires $\dfrac{2}{3}$ cup of butter for two batches of cookies. If one stick of butter is equal to $\dfrac{1}{2}$ cup, how many sticks of butter are needed to make 12 batches of cookies?

    (CCSS: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.)

2. The volume of a box is 11,520 cubic inches. If the box is 30 inches long and 24 inches wide, how tall is the box?

    (CCSS: Understand concepts of volume and relate volume to multiplication.)

6th Grade:

1.	At one point in the season, a team had won 30 games. From that point on, they won 12 games and lost 8 games, finishing by having won 60% of the games for the season. How many games did the team lose?

	(CCSS: Understand ratio concepts and use ratio reasoning to solve problems.)

2.	The tower shown is made up on cubes that are 18 **inches** on each side. If the entire figure is to be painted, including the top, bottom and all sides that are showing (not those where two blocks are connected), how many **square feet** will need to be covered?
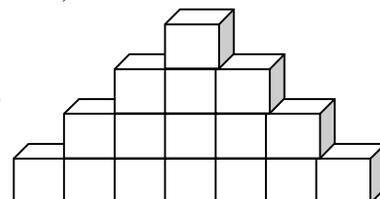
	(CCSS: Solve mathematical problems involving area, surface area, and volume.)

7th Grade:

1.	Shannon has 5 pennies, 15 nickels, 20 dimes and 10 quarters in her purse. If she gives a friend a random coin from her purse, what is the probability that she has given them less than 10 cents?

	(CCSS: Investigate chance processes and develop and use probability models.)

2.	In triangle ABC, the measure of angle A is $15°$ less than the measure of angle B. The measure of angle C is $45°$ more than the measure of angle B. What is the degree measure of the smallest angle?

	(CCSS: Solve mathematical problems involving angle measure.)

8th Grade:

1.	What is the perimeter of the figure shown?

	(CCSS: Understand and apply the Pythagorean Theorem.)
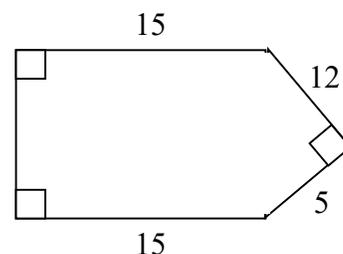
2.	The table gives values for $y = mx + b$. For what value of x is $y = 8$?

x	-4	3	7
y	-2	12	20

	(CCSS: Use functions to model relationships between quantities.)

3.	If $\dfrac{a \times 10^{14}}{3.0 \times 10^5} = 2.1 \times 10^b$ where a is a positive integer less than 10, what is the sum of a and b?

	(CCSS: Work with integer exponents.)