

This practice plan was created by **Taren Long**, a math teacher and coach at Chesapeake Public Charter School. Taren created numerous free resources for MATHCOUNTS coaches in her role as the 2020-2021 DoD STEM Ambassador for MATHCOUNTS. Find more resources and information at dodstem.us.

Addition and Subtraction Strategies



Warm-Up!

Try these problems before watching the lesson.

- Given that the digits 1, 2, 3, 4, 5 and 6 are placed in the boxes shown, what is the greatest possible positive difference that can be obtained?

$$\begin{array}{r} \square\square\square \\ -\square\square\square \\ \hline \end{array}$$

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- If n and m are whole numbers, $99 < n < 401$, and $19 < m < 81$, what is the greatest possible value of $\frac{n}{m}$?

- What is the sum of the three missing digits in the subtraction problem $5_ , 661 - _ 2, 83 _ = 17, 825$?

- The integer 12,345 can be expressed as the sum of two prime numbers in exactly one way. What is the larger of the two primes in this sum?



The Problems

Take a look at the following problems and follow along as they are explained in the video.

6. For positive integers x and y , $\frac{1}{x} + \frac{1}{y} = \frac{5}{12}$. What is the least possible value of $x + y$?
7. Using each of the digits 3, 5, 7, 9 exactly once in the expression of the sum below, what is the larger of the two common fractions that would give a sum between 0.75 and 1?

$$\frac{\square}{\square} + \frac{\square}{\square}$$

8. What is the difference between the sum of the first 400 even counting numbers and the sum of the first 400 odd counting numbers?



Piece It Together

Use the skills you practiced in the warm-up and strategies from the video to solve the following problems.

9. For positive integers x and y , $\frac{1}{x} - \frac{1}{y} = \frac{1}{12}$. What is the least possible value of $x + y$?
10. Use the digits 1-6, at most one time each, to create an equation where x has the greatest possible value.

$$\square\square + x = \square\square$$

11. The denominator of a fraction is 2 more than its numerator. The reciprocal of this fraction is equal to the fraction itself. What is the sum of the numerator and denominator?
12. The fraction $\frac{x}{5}$ does not change its value when 3 is added to both its numerator and its denominator. What is the value of x ?



Optional Extension

To extend your understanding and have a little fun with math, try the following activities.

Using the digits 1-9, at most one time each, fill in the boxes to make the smallest (or largest) difference. Try this first using only positive numbers and positive differences. How would your solution change if you allow negative integers? What types of differences can you make? Are there any differences you cannot obtain?

$$\pm \square\square - \pm \square\square$$