

Parity Lesson Plan

WARMUP while waiting for everyone to get here:

Some people think that every **even** number greater than 2 can be written as the sum of two **prime numbers**? Here are a few: $4 = 2 + 2$ $6 = 3 + 3$ $8 = 3 + 5$

Can you find more?

Do you think this is true for all even numbers?

Consecutive Arithmetic:

Notice that $5 \times 6 \times 7 = 14 \times 15$ (the product of these three consecutive integers equals the product of two consecutive integers).

1. Find three consecutive positive integers a, b, c and two consecutive positive integers d and e so that:

$$a + b + c = d + e$$

2. Can you find another set?
3. What patterns do you notice about the answers?
4. (Optional) Are there three consecutive positive integers a, b, c and two consecutive positive integers d and e so that

$$a - b - c = d - e ?$$

5. On a chessboard, a knight starts at the upper left corner. Can it return there after making 7 moves? 6 moves?
6. Nine gears are placed on a plane, arranged in an ellipse. Can they all turn at the same time? (I'll draw this on the white board.)
7. Can a knight starting in the same place, move to the lower right square?

Problems for Home

Find another example of consecutive positive integers (none of which equal 1) satisfying $a \times b \times c = d \times e$.

Notice that $(3^4)^5 = 9^{10}$. Find an example of consecutive positive integers (none of which equals 1) satisfying $a^{(bc)} = d^e$. Note that is a little different problem than the example.