

# Mathematical Thinking.

## Test Flight Assignment Solutions.

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### Question 6

**Proposition 1.** *The only prime triple is 3, 5, 7.*

*Proof.* Suppose to the contrary that there exists a natural number  $x > 3$  such that  $x, x + 2, x + 4$  form a prime triple. Following Proposition 5, at least one of  $x, x + 2, x + 4$  is divisible by 3.

This implies that at least one of  $x, x + 2, x + 4$  has 2 divisors (one of which is 3). This contradicts the initial assumption that  $x, x + 2, x + 4$  form a prime triple. Hence it must be the case that there is no natural numbers greater than 3 such that  $x, x + 2, x + 4$  form a prime triple.  $\square$