

Number Theory Answer Key

Warm-up:

1. See our notes on SFFT (Lesson 4) at sem-amc-club.tk/Week4.pdf

Solutions are $(0, 3)$, $(1, 1)$, $(3, 0)$

2. Two numbers are coprime if they share no factors other than 1. A good rule of thumb is that a and b are coprime if and only if there exist integers p and q such that $ap + bq = 1$.

- Coprime ($\gcd(2, 3) = 1$, $-1 \cdot 2 + 1 \cdot 3 = 1$)
- Not coprime ($\gcd(6, 8) = 2$)
- Coprime ($\gcd(1, 9) = 1$, $1 \cdot 1 + 0 \cdot 9 = 1$)
- Not coprime ($\gcd(0, 5) = 5$)

3. See [Euclidean Algorithm](#) on AoPS.

Note that $a \cdot b = \gcd(a, b) \cdot \text{lcm}(a, b)$.

Exercises:

1. E
2. E
3. D
4. D
5. B
6. B
7. See solution at <https://bit.ly/2sAJ3V5>