Problem 2-1

Since 1 is not a prime, the three smallest primes are 2, 3, and 5. Their sum is 10. The first square after 10 is 16, and $2 + 3 + 11 = \boxed{16}$.

Problem 2-2

Gerry arrived x hours past noon, Dale arrived 4 hours later, and x hours later, it was 5 PM, so $2x + 4 = 5$. Thus, $x = 0.5$, so Gerry arrived at $\boxed{\text{12:30 PM}}$.

Problem 2-3

Since $\dfrac{x^2+2021x+2020}{x^2-2020x-2021} = \dfrac{(x+2020)(x+1)}{(x-2021)(x+1)} = 2$, and since $x \neq -1$, it follows that $x+2020 = 2(x-2021)$, from which $x = \boxed{6062}$.

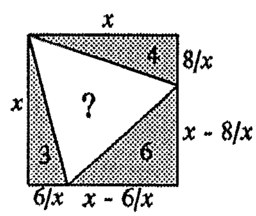
Problem 2-4

The first four odd squares are 1, 9, 25, and 49. Their differences are 8, 16, 24, 40, and 48. All are multiples of 8. Now pick two odd numbers $2x+1$ and $2y+1$. If $2x+1 > 2y+1$, then the difference of their squares factors into $4(x-y)(x+y+1)$. Since $x-y$ and $x+y+1$ have opposite parities, one of them must be even (hence divisible by 2). Therefore, the difference of their square factors is divisible by $4\times 2 = 8$. Since $3^2-1^2 = 8$, the greatest integer divisor is $4\times 2 = \boxed{8}$.

Problem 2-5

Every multiple of 1000 is divisible by 8, so a 4-digit number is divisible by 8 if, after removing its thousands digit, the remaining 3-digit number is divisible by 8. From 500 to 599, the 12 numbers 504, 512, 520, 528, 536, 544, 552, 560, 568, 576, 584, and 592 are the only ones divisible by 8. For each thousands digit, there are 12 numbers with hundreds digit 5 that are divisible by 8. Therefore, the total number of such numbers from 1000 to 9999 is $9\times 12 = \boxed{108}$.

Problem 2-6



Call the length of one side of the square x. Since the areas of the two smaller shaded triangles are 3 and 4, the shorter legs of these right triangles have respective lengths $6/x$ and $8/x$. Subtracting from x, the respective lengths of the legs of the large shaded right triangle are $x-(6/x) = (x^2-6)/x$ and $x-(8/x) = (x^2-8)/x$. The product of these legs is twice the area of the largest shaded triangle, so it follows that $(x^2-6)(x^2-8)/x^2 = 12$. Clear fractions, expand, and factor, and you'll get $x^4-26x^2+48 = 0 = (x^2-24)(x^2-2)$. Either $x^2 = 2$ or $x^2 = 24$. Since the area of the square is x^2, and the area of the square exceeds 2, it follows that $x^2 = 24$. Finally, the area of the unshaded triangle is $24 - (3+6+4) = \boxed{11}$.