Math 4a HW 5.

#1. a. yes, among 4 consecutive natural numbers will be 2 even and 2 odd.
Only 1 possible remainder 1. (or 0 for even numbers)

b. yes. When number is divided by 3 possible remainders are 1, 2, (and 0).

| | $n$ | $n+1$ | $n+2$ | $n+3$ |
|---|---|---|---|---|
| Rem. | 0 | 1 | 2 | 0 |
| | 1 | 2 | 0 | 1 |
| | 2 | 0 | 1 | 2 |

c. yes. Possible remainders are 1, 2, 3, (0).

| | $n$ | $n+1$ | $n+2$ | $n+3$ |
|---|---|---|---|---|
| Rem. | 0 | 1 | 2 | 3 |
| | 1 | 2 | 3 | 0 |
| | 2 | 3 | 0 | 1 |
| | 3 | 0 | 1 | 2 |

d. no. There are 4 possible remainders

$n$ $\quad n+1$ $\quad n+2$ $\quad n+3$

Rem. 1 2 3 4 0 possible situation.

#2.

a. 5, 25, 35, 75, 80

b. 5, 25

c. $42 = 6 \cdot 7 = 2 \cdot 3 \cdot 7$, Divisors of 42 ar 2, 3, 6, 7, 14, 21, 42, 1

Not ar divisors from numbers of problem:
5, 25, 28, 35, 56, 75, 80.

d. M. of 4 are 28, 42, 56, 80
M. of 7. 7, 21, 28, 56
Mult. of 4 and 7. 28, 42, 56

e. 7, 21, 28, 42, 56, 80, 35

#3. For four different prime numbers it's not possible, because prime representation is unique.

#4.

If they are all bicycles, there would be $21 \cdot 2 = 42$ wheels. But there are 55 wheels.

$55 - 42 = 13$ wheels are from tricycles.

$21 - 13 = 8$ bicycles.

Answer: there are 8 bicycles and 13 tricycles.

#5. $12 = 2 \cdot 2 \cdot 3$

$10 = 2 \cdot 5$

$15 = 3 \cdot 5$

$LCM = 2 \cdot 2 \cdot 3 \cdot 5 = 60$

$60 : 10 = 6$ boxes of knives

$60 : 12 = 5$ boxes of forks

$60 : 15 = 4$ boxes of spoons

#6.

$28+29=57$

$57:9=3$

$3\cdot 70=210$

$210-180=30$

$6\cdot 25=150$

$150:50=3$

$3\cdot 11=33$

$33+17=50.$

#7. $(\overline{aa}+\overline{aa}+1)\cdot\overline{a}=\overline{aaa}$

( $\overline{aa}$ means that it's a 2-digit number, both digits are the same)

$\overline{aa}+\overline{aa}+1$ should be equal to 111 because if this sum is multiplied by a 1-digit number and the result is 3-digit number with all three didgits same as 1-digit factor.

like $111\cdot 3=333$, $111\cdot 7=777$.

设 $\overline{aa} + \overline{aa} + 1 = 111$

$\overline{aa} + \overline{aa} = 110$.

$\overline{aa} = 55$

$(55 + 55 + 1) \cdot 5 = 555$.