Answers 4.5



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1. There are 22 pairs of homologous chromosomes in a single human body cell, and 2 sex chromosomes (which make another pair…but it is not homologous)
2. Nondisjunction occurs when there are errors during meiosis, and when homologous chromosmes do not separate during meiosis. This results in gametes with the wrong number of chromosomes.
3. In the case of Down Syndrome, a somatic cell could have 47 chromosomes by having 3 pairs of chromosome 21 (instead of 2). If a gamete with 24 chromosomes fertilizes with a gamete with 23 chromosomes, the resulting somatic cell could have 47 chromosomes.
4. 45. Just like the zygote.
5. A) the first line only ? B) 4 C)2
6. A) 47 B) The zygote of a person with Down syndrome has 47 chromosomes. Thus, one gamete has 23 and the other 24 chromosomes.
7. Turner Syndrome and Klinefelter syndrome
8. A)Turner syndrome only exists in females and occurs when a female is born with one X chromosome. B) One of the gametes is missing from the sex chromosome, and as a result, the female reproductive organs do not develop at puberty and they do not menstruate and cannot reproduce.
9. A) normal male: 44XY

 B) normal female 44XX

 c) Klinefelter syndrome male 44XXY

 d) Down syndrome female 45XX

 e) turner syndrome female 44X

 f) down syndrome male 45XY

10) Down syndrome: the extra chromosome is a result of chromosome 21 which is not a sex chromosome. Klinefelter Syndrome: the extra chromosome is a result of the sex chromosome (two Xs rather than 1 X from the egg)

11) Generally, but there are exceptions….as in all generalisations. Consider someone with Down Syndrome. Chromosome 21 is not a homologous pair, but rather, there are three chromosomes.

12) Klinefelter syndrome