Cell Cycle

Terms:

apoptosis	cyclin-dependent kinase (Cdk)	homologue	p53
apoptosome	cytochrome c	interphase	phases of mitosis
Bcl2, Bak, Bax, Bad	cytokinesis	kinetochore	restriction point, Start
caspases	G_1	mitogen	sister chromatid
checkpoint	G_1, G_2, S, M phases	mitosis-promoting factor (MPF)	spindle checkpoint
chromosome	G_1/S checkpoint	mitotic spindle	survival factor
contractile ring	G_2/M checkpoint	oncogene, proto-oncogene	tumor suppressor
cyclin	growth factor		

Match the definition below with its term from the list above:

1. the long period of the cell between one mitosis and the next
2. final stage of mitosis in which two sets of separated chromosomes decondense and become enclosed by nuclear envelopes
3. division of the cytoplasm of a plant or animal cell into two
4. circular band containing actin and myosin that forms under the surface of animal cells undergoing cell division and contracts to pinch the two daughter cells apart
5. the checkpoint in the cell cycle at which the cell commits to replicate its DNA
6. the phase of the cell cycle between the end of cytokinesis and the start of DNA synthesis
7. a member of the family of protein kinases that are activated by binding to cyclin proteins
8. one of several places in the eukaryotic cell cycle where progression through the cycle can be halted until conditions are suitable
9. one of a family of proteins that rise and fall in concentration in step with the cell cycle, thereby regulating the activity of crucial enzymes that control progression through the cell cycle
10. mechanism ensuring that cells do not enter anaphase until all chromosomes are correctly attached on the mitotic spindle
11. mutated in about half of human cancers. It encodes a gene regulatory protein that is activated by DNA damage.
12. general term for a gene that normally drives cell division; a gain of function mutation in this type of gene can drive a cell toward cancer
13. a family of proteases that plays a key role in programmed cell death
14. an anti-apoptotic member of the Bcl-2 family of regulatory proteins
15. proteins that facilitate the escape of cytochrome c from mitochondria
16. a large quaternary protein structure involved in the early stages of apoptosis
17. a signal molecule that initiates a signal that ultimately pushes cells past the restriction point

TRUE / FALSE, explain:

1. After the nuclear envelope breaks down, microtubules gain access to the chromosomes and, every so often, a randomly probing microtubule connects with a kinetochore and "captures" the chromosome.
2. Since there about 10^{13} cells in an adult human, and about 10^{10} cells die and are replaced each day, we become completely new people every three years.
3. Although the lengths of all phases of the cell cycle are variable to some extent, by far the greatest variation occurs in the duration of G_1.
4. Individuals that inherit an inactive copy of a tumor suppressor gene are more likely to develop cancer than individuals with two functional copies.
5. A mitogen and a proto-oncogene can act via the same signaling pathway.