

PART 1: LABEL THE CELL CYCLE DIAGRAM

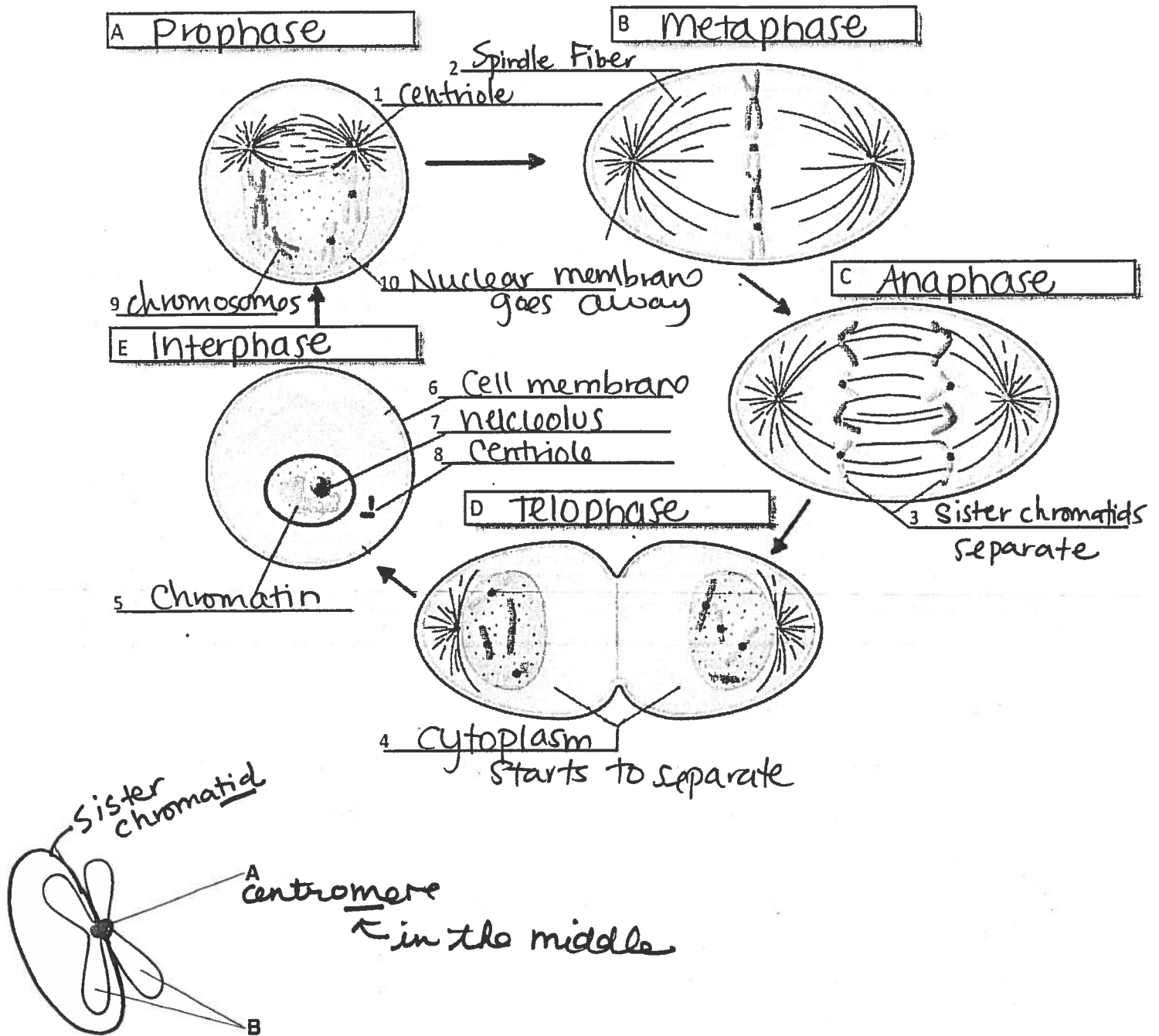


Figure 10-2

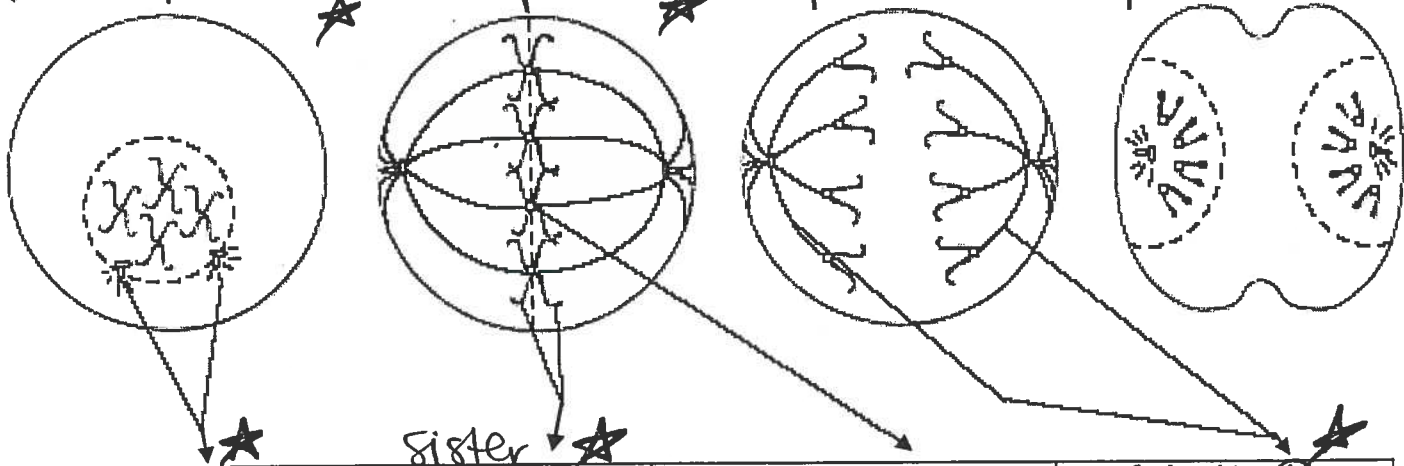
11. The structure labeled A in Figure 10-2 is called the centromere
12. The structures labeled B in Figure 10-2 are called Sister chromatids

PART 2: MITOSIS

Label the picture below to identify the phases of mitosis. Use these choices:

- | | | | |
|---------------------|----------------------|---------------------|----------------------|
| anaphase | metaphase | prophase | telophase |
|---------------------|----------------------|---------------------|----------------------|

★ 1. Prophase ★ 2. Metaphase ★ 3. Anaphase ★ 4. Telophase



- | | | | |
|------------------------|-------------------------------|------------------------|---------------------------|
| ★ 5. <u>Centrioles</u> | ★ 6. <u>Sister chromatids</u> | ★ 7. <u>Centromere</u> | ★ 8. <u>Spindle fiber</u> |
|------------------------|-------------------------------|------------------------|---------------------------|

Label the cell parts indicated above, using these choices:

- | | | | |
|------------------------------|-----------------------|---------------------------|-----------------------|
| sister chromatids | centromere | spindle fibers | centrioles |
|------------------------------|-----------------------|---------------------------|-----------------------|

PART 3: INTERPHASE VS MITOSIS

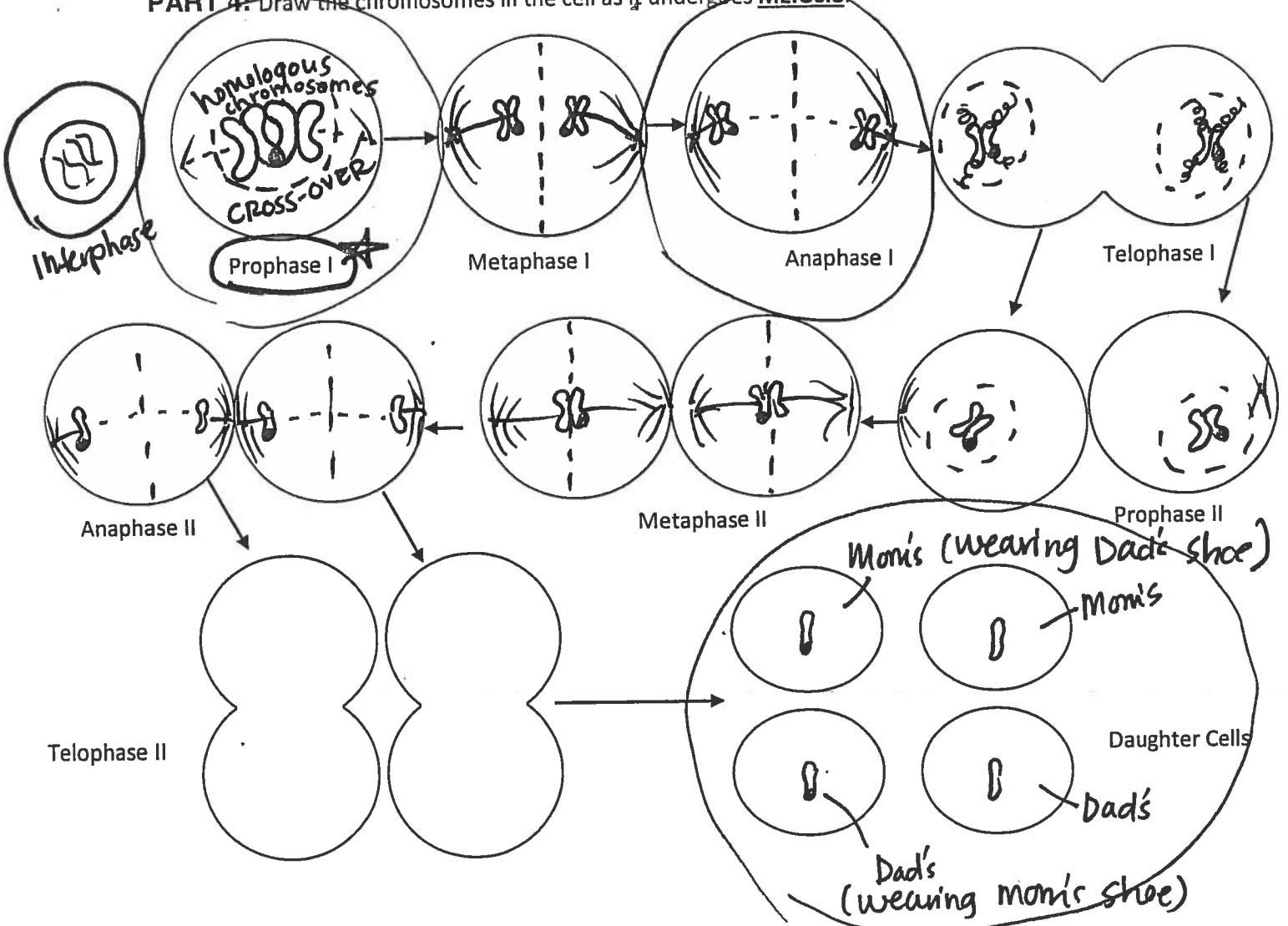
For each of the actions below, tell if it occurs during interphase or some phase of mitosis.

I. Interphase

M. Mitosis

- I 9. Cell growth occurs.
- ★ M 10. Nuclear division occurs. - change of DNA
- M 11. Chromosomes are distributed equally to daughter cells.
- I 12. Protein production is high.
- I 13. Chromosomes are duplicated. (S)
- ★ I 14. DNA synthesis occurs. Same as 13
- M 15. Cytoplasm divides immediately after this period.
- I 16. Mitochondria and other organelles are manufactured.
- I 17. DNA may be miscopied resulting in cell changes leading to cancerous cell division

PART 4: Draw the chromosomes in the cell as it undergoes MEIOSIS:

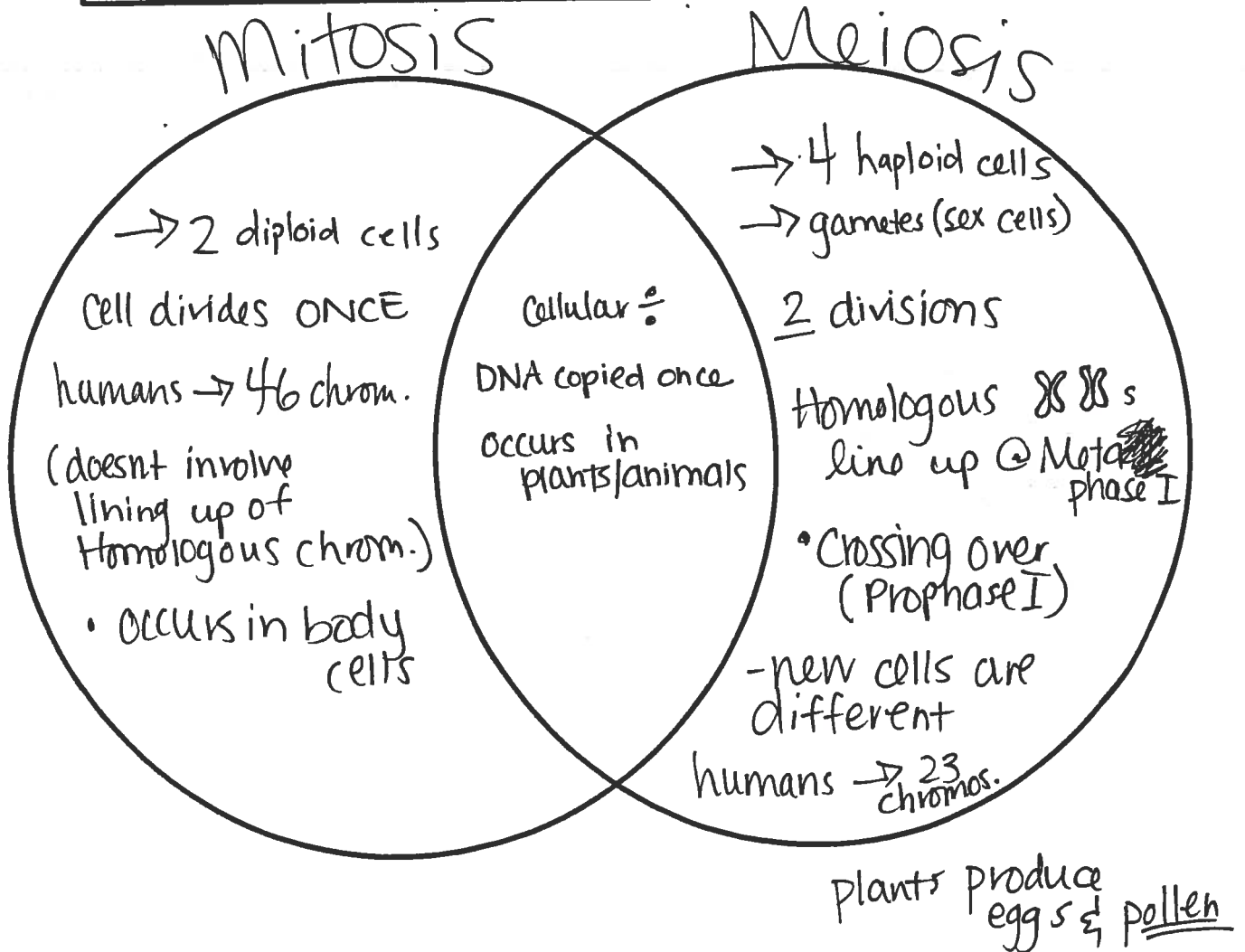


Write the correct Meiotic Phase next to the description:

- ★ ① meta I homologous chromosome line up in the center of the cell
2. Ana I spindle fibers pull homologous pairs to ends of the cell
3. Telo II 4 haploid (N) daughter cells form
4. Interphase cells undergo a round of DNA replication
5. Ana II sister chromatids separate from each other
6. Telo I 2 haploid (N) daughter cells form
7. Pro I spindle fibers attach to the homologous chromosome pairs
8. Ana II - Telo II individual chromatids move to each end of the cell
- ★ ⑨ Pro I crossing-over (if any) occurs

PART 5: Create a Venn Diagram to Compare and Contrast Mitosis and Meiosis
 ~Use the following terms or phrases:

produces haploid cells	produces 4 cells
occurs in germ cells (produces sex cells)	DNA is copied once
occurs in plant and animal cells	involves cellular division
In humans, produces cells with 23 Chromosomes	cell divides only once
homologous chromosomes line up during Metaphase	produces 2 cells
has 2 divisions	new cells are different from each other
In humans, produces cells with 46 Chromosomes	occurs in body (somatic) cells
Does not involve lining up of homologous Chromosomes	crossing over occurs, creating new genetic combinations in offspring



6

PART 6: FILL IN THE BLANK

Use each of the terms below just once to complete the passage:

nucleus	genetic material	chromosomes	packed
identical	chromatin	vanish	cell division

The process by which two cells are produced from one cell is called (18) cell division. The two cells are (19) identical to the original cell. Early biologists observed that just before cell division, several short, stringy structures appeared in the (20) nucleus. These structures seemed to (21) vanish soon after cell division. These structures, which contain DNA and became darkly colored when stained, are now called (22) chromosomes. Scientists eventually learned that chromosomes carry (23) genetic material, which is copied and passed on from generation to generation. Chromosomes normally exist as (24) chromatin, long strands of DNA wrapped around proteins. However, before a cell divides, the chromatin becomes tightly (25) packed.

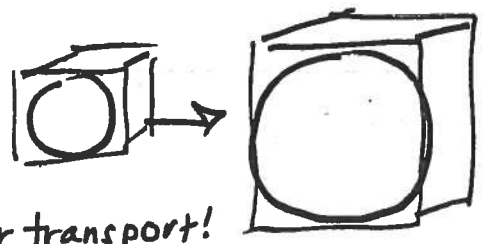
7

PART 7: MULTIPLE CHOICE

a
this is why cells are small

1. As a cell becomes larger, its
- a. volume increases faster than its surface area.
 - b. surface area increases faster than its volume.
 - c. volume increases, but its surface area stays the same.
 - d. surface area stays the same, but its volume increases.

$h \times w \times l$
 $h \times w \times \# \text{ of sides}$



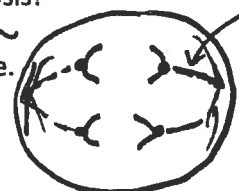
* surface area is needed for cellular transport!

d

2. Which of the following is a correct statement about the events of the cell cycle?
- a. Little happens during the G_1 and G_2 phases. growth
 - b. DNA replicates during cytokinesis. S phase
 - c. The M phase is usually the longest phase. Interphase
 - d. Interphase consists of the G_1 , S , and G_2 phases. ✓

a

3. What is the role of the spindle during mitosis?
- a. It helps separate the chromosomes. ~
 - b. It breaks down the nuclear membrane.
 - c. It duplicates the DNA.
 - d. It divides the cell in half.



Spindle fibers are like lassos that hold on to chromosomes & pull sister chromatids apart!

c

4. Cancer is a disorder in which some cells have lost the ability to control their
- a. size. cells stay ~ same size
 - b. spindle fibers.
 - c. growth rate.
 - d. surface area.

How fast they reproduce/divide

b

5. If an organism's diploid number is 12, its haploid number is
- a. 12.
 - b. 6.
 - c. 24
 - d. 3

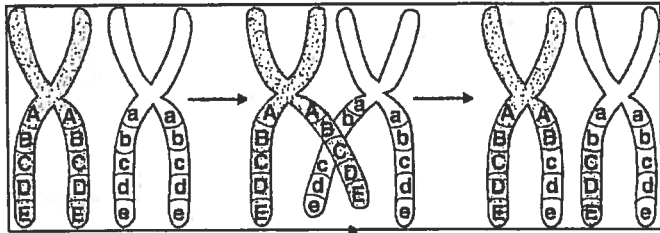
$$\frac{12}{2} = 6$$

double/normal → half

d

6. Gametes have
- a. homologous chromosomes.
 - b. twice the number of chromosomes found in body cells. Half!
 - c. two sets of chromosomes. ONE!
 - d. one allele for each gene.

≡ a variation of a gene (DNA segment) Your Body cells have 1 allele from Mom & 1 allele from dad for EACH gene * more on alleles LATER



C

7. What is shown in the figure above?
- a. independent assortment
 - b. anaphase I of meiosis
 - c. crossing over
 - d. replication

Mom & Dad trading shoes!

don't worry about them now 😊

b

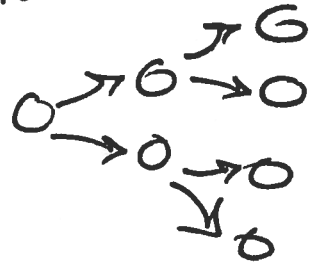
8. Unlike mitosis, meiosis results in the formation of
- a. diploid cells. (2n)
 - b. haploid cells. (n)
 - c. 2 daughter cells (n) = diploid
 - d. body cells

SEX cells = meiosis

b

9. Unlike mitosis, meiosis results in the formation of
- a. two genetically identical cells.
 - b. four genetically different cells.
 - c. four genetically identical cells
 - d. two genetically different cells

mitosis



genetic variation among siblings

10. Which pair is correct?

- a. G₁ phase, DNA replication ~~growth~~
- b. G₂ phase, preparation for mitosis ✓
- c. S phase, cell division ~~DNA replication~~
- d. M phase, cell growth ~~nuclear division~~

(dance!) division of DNA

~~Don't Forget to Study!~~
You better...