Explain the importance of mitosis

- Repair (replace worn-out cells and make more of these cells
- Growth
- Asexual reproduction (Single-celled organisms eg. bacteria and yeast)
- Allow cells to divide, increase in mass

Explain the need for the production of genetically identical cells

- Identical - number of chromosomes is same or else offspring could be abnormal (mutations) as DNA contain information for organism to function normally
- Not so fun fact #1: Turner syndrome happens when you have 45 chromosomes (missing chromosome 21)
- Not so fun fact #2: Down syndrome happens when you have 47 chromosomes (extra chromosome 21)
- in order to pass down to offspring

Identify, with the aid of diagrams, the main stages of mitosis (prophase, metaphase, anaphase and telophase) 2n=4

- Mitosis goes in that order (PMAT - heh pee on the mat)
- Chromosomes dont move on their own because they need their bros
- Every centromere moves with a spindle
- Prophase - Chromatin fibers coiled and folded, nuclear envelope still present, mitotic spindle begins to form, centrosomes start to move away from each other
- Metaphase - 2n chromosomes (so 8 sister/not so sister chromatids) line up on metaphase plate, perpendicular to the mitotic spindles
- Anaphase - 2 centromeres of each chromosome come apart, daughter chromosomes formed, cell elongates, kinetochores are the ones moving the chromosomes
- Telophase + cytokinesis - chromosomes uncoil, cytoplasm begins to split (already have 2 nucleus), nuclear envelope begins to form

Describe with the aid of diagrams, the behaviour of chromosomes during the mitotic cell cycle and the associated behaviour of the nuclear envelope, cell membrane and centrioles

- G1, S, G2 are called interphase
- S is where DNA replicates
- By the time it reaches S, cell already made copy of DNA
- The sisters are bound by centromere (???)

Distinguish between nuclear division (mitosis) and cytokinesis with reference to both plants and animal cells

- the spelling.
- cytokinesis is division of cytoplasm, mitosis is division of the nucleus (nucleus must make sure there's enough chromosomes before dividing)
- cytokinesis in plant cells - cell plate formation

Plant cell	Animal cell

Explain how uncontrolled cell division can result in cancer, and identify causative factors (eg. genetics, chemical carcinogens, radiation, loss of immunity) which can increase the chances of cancerous growth. (Knowledge that dysregulation of checkpoints of cell division can result in uncontrolled cell division and cancer is required, but details of mechanism is not required)

Describe the functions of common proto-