Question 32.

a) i) body covering of hair

ii) * Australopithecus afarensis had a pronounced ridge above the eyes according to fossils found, where as the Homo sapien skeleton does not exhibit this characteristic.

* Australopithecus afarensis had no chin which is a major difference in structure in comparison to Homo sapens.

b) i Radiometric dating involves analysing the carbon-14 content of a fossil sample, using the half-life of the ~~radioactive~~ decaying substance. Information about the use of such data could be collected by researching the processes involved with using ~~varying rate~~ radiometric data and the types of fossils it can be used to date. This could be obtained by studying the work of particular ~~scientists~~ palaeontologists who have used such a technique and information from resources such as books, magazines and the Internet.

ii • determine the source of data and who

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it is by - check that it is official. - reliability

- compare the information in different sources noting similarities and differences.
- check the date on the information. Rapid advancements in technologies means that ~~things~~ information can become outdated and irrelevant.

c) Individuals of ancestral stock from regions close to the equator such as Africans tend to ~~be~~ have heavy skin pigmentation. ~~The~~ The evolutionary significance of this phenotype is that it protects the skin from the harmful effects of UV rays from the sun which cause skin cancer. Individuals that live in the very high or low latitudes tend to have small amounts of melanin in their skin & thus their skin is lighter. This aspect of skin pigmentation is evolutionary significant because they need to maximise their absorption of sunlight so that they can produce vitamin D. The geographical location of humans requires certain adaptations to enable survival.

d) Prosimians are lower primates and include animals such as lemurs, tarsiers and bush babies. When compared to New and Old world monkeys, ~~it's and~~ apes and humans, it seems evident that they have a much smaller brain size. New world monkeys such as spider monkeys and howler monkeys have a larger brain size, similar to the Old World monkeys - ~~and~~ such as baboons and both display ~~highly~~ highly curious, investigative and social behaviours. As we move to apes, which again have a large

brain size, the intelligence of these organisms increases. ~~Humans have the largest brain to body size as well as exhibiting the most comp~~ as well as their social behaviour. Humans have the largest brain to body size of all the primates and also show the most complex behaviour and social organisation. From the information gathered about brain capacity of prosimians, monkeys, apes and humans it compare communicates the idea that the larger and more developed the brain is the ~~the~~ greater the intelligence of the species. Humans have largest brain size and it is known that we exhibit the most complex behaviour, and culture than any other primates. Apes have a more developed brain than

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monkeys and is expressed through their more cohesive social groups and intelligence

Prosimians and New World monkeys are totally arboreal. Although Old World Monkeys spend a more time on the ground foraging for food they still dwell in trees and have a different spine shape and position of the ~~foot~~ foramen magnum than apes and humans. Apes spend more time in a semi upright and upright stance than monkeys and prosimians. This means they they dwell on the ground for the majority of time. Humans have an upright stance and bipedal gait - allowed because of the shape of the spine and the position of the foramen magnum. From this information it would seem that

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the greater the degree of upright stance (depends on curvature of spine + position of upright stance) seems to mean that the ~~oregon~~ primate is not tree dwelling. Humans - have total upright stance - not ~~the~~ tree dwellers, apes have semi-upright stance = spend less time on trees than monkeys with no upright stance
This information that humans ~~are~~ are closer related to apes (chimps etc) than monkeys and prosimians.

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e) I predict that the main factors would be genetic engineering and various reproductive technologies. Genetic engineering through the technique of cloning produces populations of organisms that are genetically identical. As a result, variation is decreased and this can be hazardous if a sudden environmental change takes place. If applied to humans, a number of times, the species or a large number of the species may be wiped out because of this lack of genetic variation. Human biological evolution may be affected further if foetus are continuesly scanned for genetic defects & subsequently aborted. This will reduce the number of deleterious genes in the population and possible increase human life expectancy. Reproductive technologies such as artificial insemination will decrease genetic variation within humans & may be detrimental to human evolution. This is because 'sperm banks' are created where desirable characteristics can be selected, thereby increasing the amount of certain genes in a population. The mapping of the human genome will also affect human biological evolution because scientists will be able to cure various genetic diseases. This means that we may live longer and a greater number of the popnlation will be elderly. Genetic

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mutations may be detected and abolished. This could be harmful to our evolution if a sudden environmental change occurs. With less variation the species is less likely to survive.