Answers 4.4

1. What is a karyotype?

*A karyotype is a profile of a person’s chromosomes*

1. During which phase of mitosis are the chromosomes photographed for karyotypes?

*Metaphase*

1. Describe the steps that are used to produce the karyotypes?

*Scientists take pictures of condensed chromosomes during metaphase. They then magnify the pictures and cut out the individual chromosomes. Homologous pairs can be matched up by shape and size.*

1. Explain why karyotypes are important for the biologist
2. How many sex chromosomes do humans have? Name them.

*2 sex cells. The X chromosome and the Y chromosome.*

1. Make a drawing of the X and Y chromosomes to show the difference in size

*The larger chromosome is the X*

1. Examine the karyotype in Figure 5. What is the gender of the individual whose karyotpe is shown?

*It is a female because all of the pairs are the same size (if there were one pair with one chromosome smaller…this would be the indication of an XY pair)*

1. A) Describe the sex chromosomes of a female human B) male?
2. *sex chromosomes in females are a pair of chromosomes that are similar in size*
3. *in males: a pair in which one chromosome is smaller than the other.*
4. Difference between the egg cell and the sperm cell in terms of sex chromosomes that may be present
5. Make a drawing to show the possible zygote formed after fertilization. Indicate whether each zygote will grow intoa female child or a male child
6. A) A family has one male child, what is the probability that the next child will be a female? B) a family has two female children. What is the probability that the next child will be a boy?

*Technically 50/50??*

1. Name two sex-linked characteristics

*Baldness, and red-green colour blindness. Hemophilia and Duchenne Muscular Dystrophy*

1. Explain why sex-linked characterisitics are expressed more often in males than females.

*This is because the X and Y chromosomes are not homologous, and the smaller Y chromosome is missing some genetic material. Sex-linked characteristics are thus often controlled by the genes on the X chromosome*

1. A) Indicate number of chromosomes in each cell. B) indicate sex cells of D and E, C) Explain how you know sex of D and E.