

MATHEMATICS TEST Year 9 – Part C

For this material *the secrecy* is valid until the end of June 2012.

After every item is given the maximum mark your solution can receive. (2/1) means that the item can give 2 g-points and 1 vg-point. Items marked with \boxtimes give you a possibility to show MVG-quality.

Most items demand full workings, which means that a single answer is not enough.

Only a correct answer gives no point, except for the items which are marked with *Only answer is requested*.

Your solution would be clear enough for another person to read and understand what you mean. It is important that you show *all* your workings. You can earn points for partially worked problems.

Tools: Calculator, ruler.

Test period: 80 minutes.

Name: _____

School: _____ Class: _____

Date of birth: Year _____ Month _____

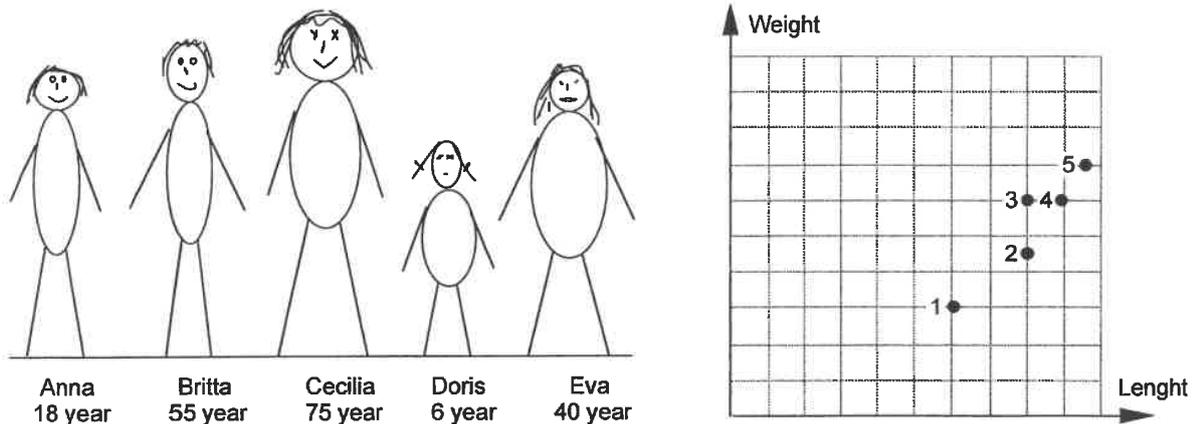
Day _____

Girl Boy

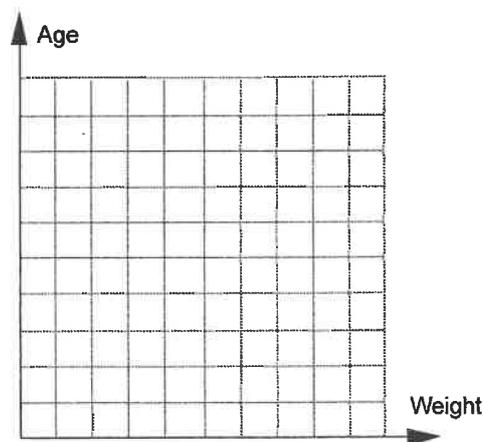
All calculations and answers should be written on paper that is handed in at the end of the test, except for item 2 a. The test packet must be handed in with your solutions.

1. A fertilized egg divides itself into two new cells. These new cells divide themselves in the same way. How many cells are there after eight divisions? (2/0)

2. a) Who is who in the diagram? Combine the right name with the right point in the diagram. *Only answer is requested.* (2/0)

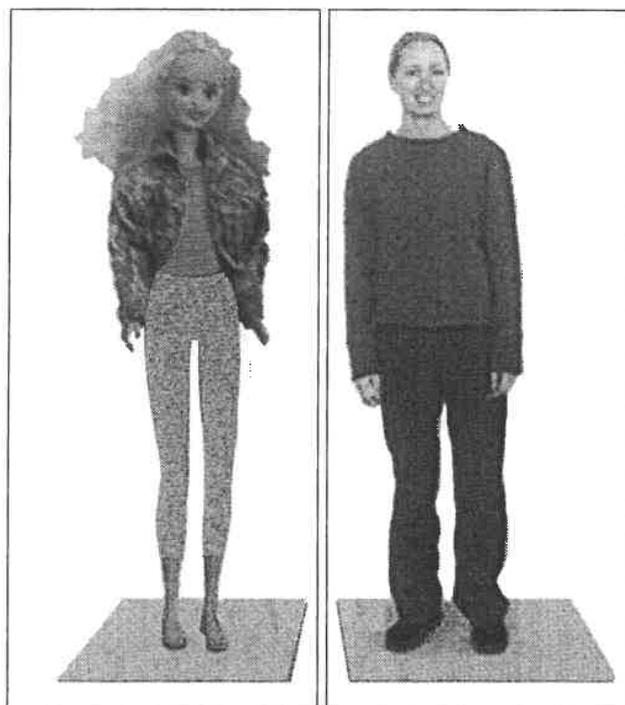


b) Put Anna, Britta and Eva in the right place in the empty diagram. (1/1)



3. Red-green colour-blindness is found in 8 % of all men and in 1 % of all women. The pupils in a class calculated how many percent of all human beings, who are colour-blind. Hedvig found that it is 9 % and Moa got the answer 4.5 %. Is anyone of them right? Motivate your answer by reasoning and calculations. (1/1)

4.



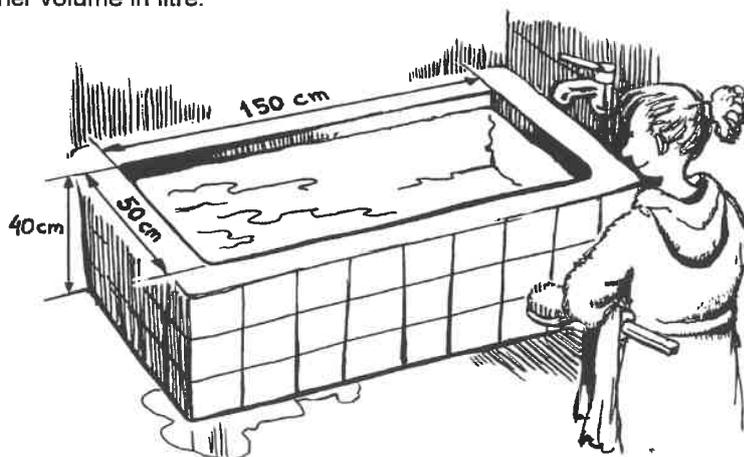
Barbie

Maja

- a) The picture of the Barbie-doll has the scale 1 : 4. How tall is the real doll? (2/0)
- b) Maja is in real life 170 cm tall. If Maja should have the same proportions as the Barbie-doll, how long legs would she then have? (1/1)

5. Milla, who is 10 years old and has a weight of 40 kg, runs a hot bath. She fills the tub up to 5 cm from the brim. Then she immerses her whole body into the water. Will the water overflow? Motivate your answer with calculations. (1/2)

Milla's weigh in kilogram is approximately as large as her volume in litre.



6.



A person of a normal build has the following distribution of different substances in the body:

Substance	Percent of body weight
Water	64 %
Fat	10 %
Carbohydrates	1 %
Proteins	15 %
Salts	5 %
Other substances	5 %

Peter is 175 cm tall, has a normal build and a weight of 70 kg.

- a) How many litres of water does Peter's body contain? One litre of water has the weight of one kilogram. (2/0)
- b) Imagine that Peter should gain 5 kg of weight without building up his muscles, that is that these 5 kg should be only fat. How many percent of fat should Peter's body be composed of after this gain of weight? (1/2)

7. One can calculate the area of the body (the area of the skin) in square metre using the formula:

$$A = 1.0 + \frac{m + h - 160}{100} \text{ where } m \text{ is the weight in kg and } h \text{ is the height in cm.}$$

- a) How many square metre of skin does Peter have? (1/1)
- b) Investigate if the formula might be true for small children. (0/2) ✖

8.

Energy table

Food	kJ/100 g
Chocolate	4 200
Chips	2 100
Apple	200
Carrot	158
Tomato	84

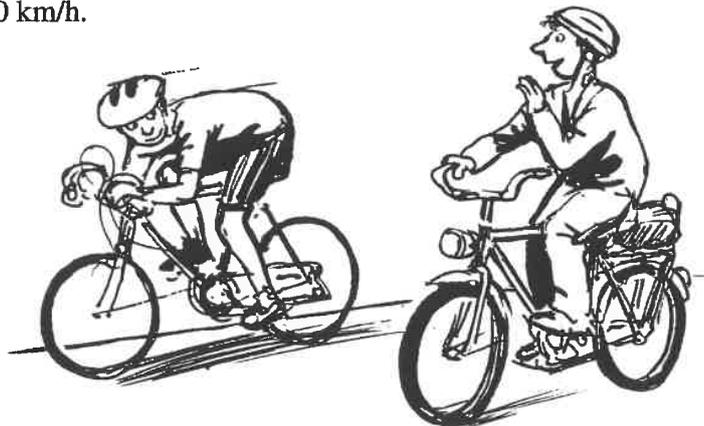
Energy consumption during 1 minute

Activity	kJ	kcal
Laying	4	1
Sitting	6	1,4
Standing	8	2
Slow walk	12	3
Quick walk	30	7
Running	60	14
Cycling	30-60	7-14
Swimming	30-60	7-14



- a) A big chocolate bar has a weight of 250 g and a normal-sized apple a weight of about 150 g. How many normal-sized apples do you have to eat to get as much energy as there is in one big chocolate bar? (1/2)

- b) If you eat more than what your body spends this energy will be stored as fat in your body. Later on you can use the fat as "fuel". 1 kg of fatty tissue contains 7 500 kcal. You want to consume the energy in 100 g fatty tissue by cycling. Investigate what distance you need to bike if you keep an average speed of 20 km/h. (1/3) □



9. The average speed of the blood in an aorta (the largest blood vessel in the body) is 0.5 m/s. An aorta can have a diameter of 15 mm. How many litres of blood pass through the aorta every minute? (1/2) □