The contents of this test paper must remain *confidential* until June 9, 2006.

After each question the maximum total number of points possible for your solution is shown. For example (2/1) indicates that the question can give a maximum of 2 g-points and 1 vg-point. You may demonstrate MVG-quality in your solutions to questions marked with the symbol ¤.

Complete solutions are required for all questions.

Merely stating the correct answer does not give any points.

Your solution must be clear enough so that other persons may easily read and understand what you mean. It is important that you present all your work. You may get some points, even for a partial solution.

Aids: Calculator, ruler and formula sheet
Time: 100 minutes

Name: _____

School: _____ Class: _____

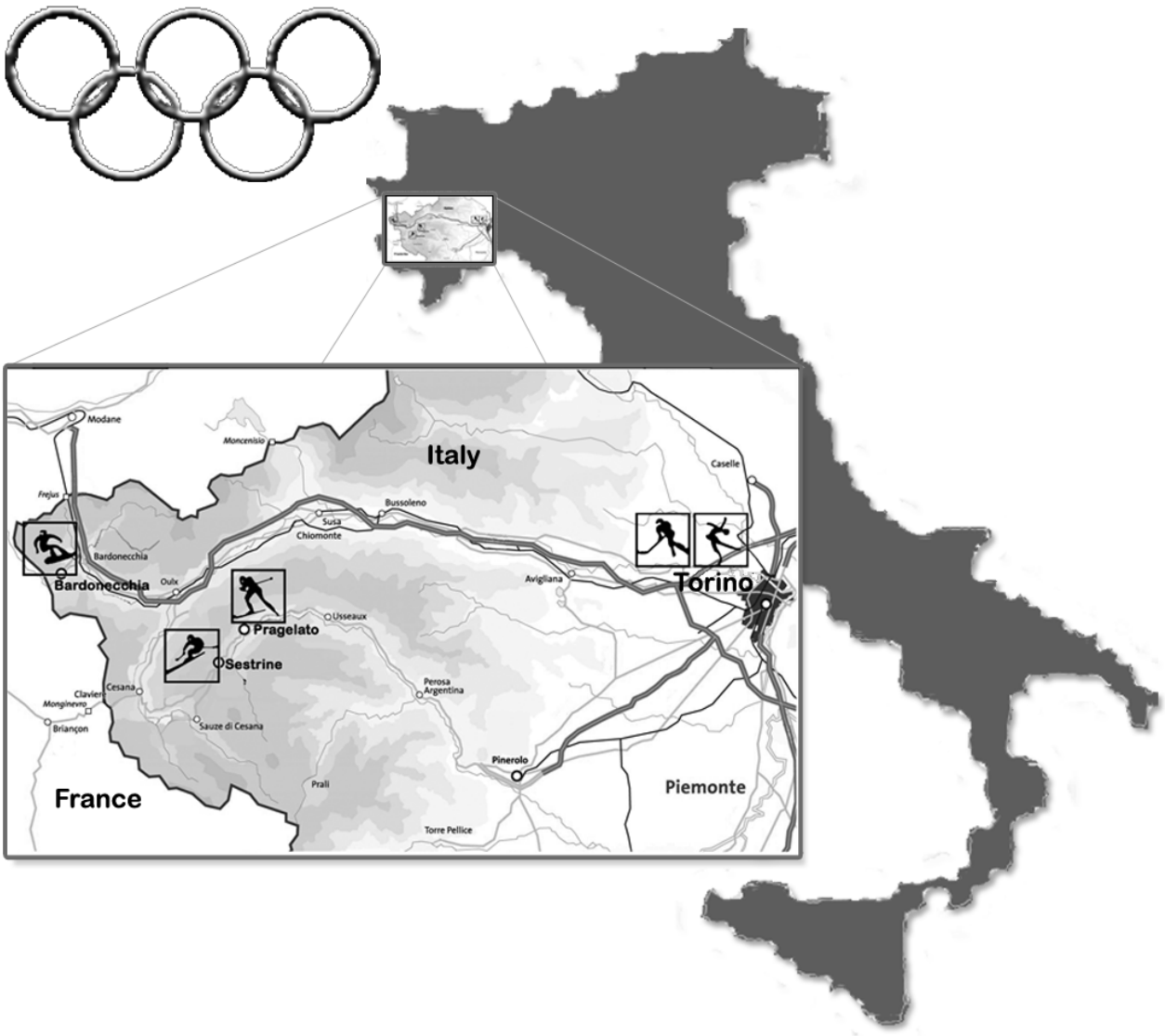
Birth date: Year _____ Month _____ Day _____

Female ❑ Male ❑

Solutions and answers must be written on separate paper, not on this question paper. The question paper must be handed in, together with your solution.

Winter Olympics 2006

In February 2006 the Winter Olympic Games were held in Torino, which is in Italy. Here you can see a map of the Olympic Games region and some of the activities are marked.



1. An Olympic gold medal consists of 89 g of silver and 6 g of gold. Find the value of the medal in kr (Swedish crowns).

Silver price 1.50 kr/g
Gold price 132.25 kr/g

(2/0)

2. There are tickets to the Olympics in Torino in two or three price categories. All prices are in euro (€). One euro (€ 1) corresponds to 9.30 kr (Swedish crowns).

	Price		
	Category A	*Category B*	*Category C*
Opening ceremony	€ 850	€ 500	€ 250
Figure skating	€ 300	€ 190	€ 100
Alpine, super G	€ 110	€ 30	–
Hockey, men's – basic series	€ 480	€ 240	–
Hockey, women's – basic series	€ 40	€ 20	–

a) What is the price in Swedish crowns (kr) for a ticket to the opening ceremony in category A? (2/0)

b) How many percent more expensive is it to buy a ticket for figure skating in category A than in category B? (1/1)

3. On the snowboard you can do "straight" tricks or tricks involving rotations. To do a "Three sixty" means that you rotate a complete whole turn. The best snowboarders can rotate 900°. How many whole turns do they rotate? (2/0)

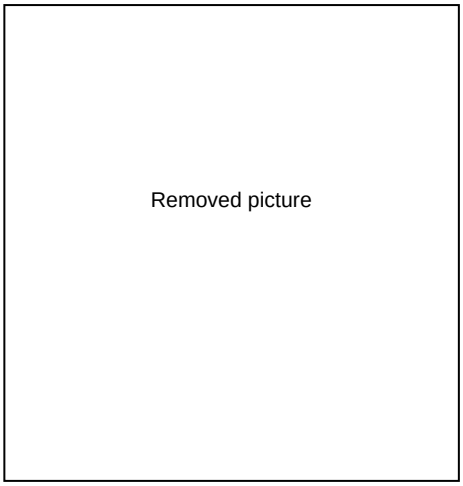
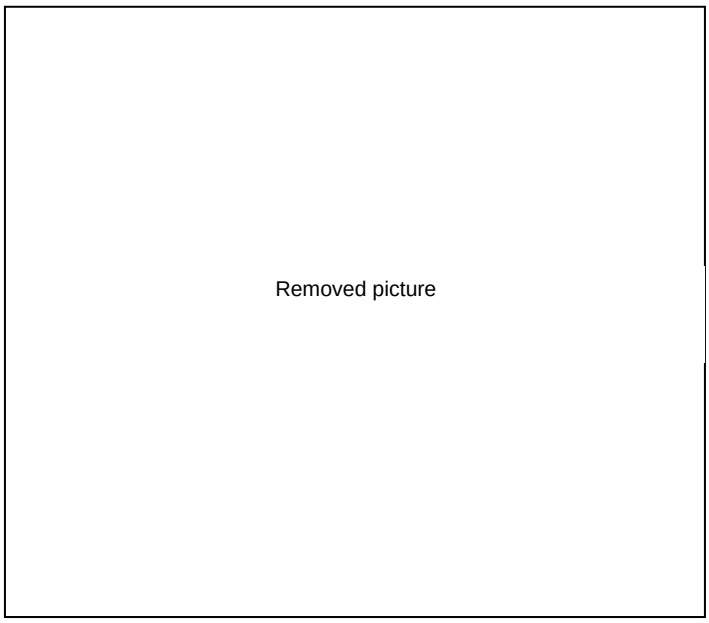


Photo: H Montgomery/Scanpix

4. Just before the Olympics were to begin in Torino there was a shortage of snow. In Pragelato where the cross-country skiing was to take place they had to improve the ski trail. They transported 3 000 m^3 of snow to the trail using trucks.

a) A truck can carry about 15 m^3 snow per load. How many loads were needed? (1/0)

b) The ski trail that had to be improved was 5 km long and about 4 m wide. What depth of snow would this give? (1/1)



Alpine skiing at the Torino Olympics took place at Sestriere.

Sestriere lies 2 035 meters above sea level.

© LaPresse

5. In the alpine slope the difference in altitude (height) between the starting and the finishing line is 500 meters. The temperature is 0.5° C colder for every 100 meter higher altitude on the slope. How many degrees was it at the starting line if it was –2° C at the finishing line? (2/0)

6. The size of ski boots is often given in EUR-sizes: ... 36, 37, 38, 39 etc.
To calculate what size of boots you need you may use the following formula, where *s* is the size and *x* is the foot length is centimetres:

$$s = \frac{3x + 5}{2}$$

a) Anna's foot is 23 cm long. What boot size does she need? (2/0)

b) Erik bought size 42 boots. How long are his feets? (0/2) ¤

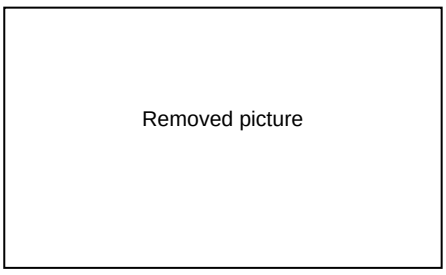
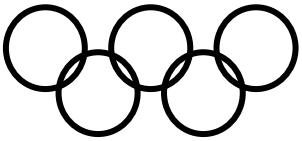
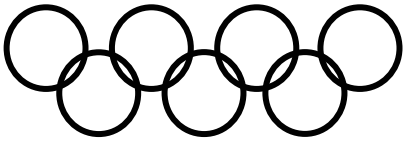


Photo: P Wissing/Scanpix

7. The table shows a pattern inspired by the Olympic rings.

	Figure (n)	Number of rings (r)	Number of points of intersection (s)
	1	5	8
	2	7	12
	3	9	16
	⋮	⋮	⋮
	n	r	s

a) How many rings are there in figure 10? Explain in some way how you reach your answer. (1/0)

b) Kalle claims that you can calculate the number of rings using the formula $r = 2n + 3$. Draw figure 4 and show that Kalle's formula works. (1/1)

c) In figure 2 there are 12 points of intersection. How many points of intersection are there in figure 6? (1/0)

d) What formula can you use to find the number of points of intersection (s) in figure n? Explain how you arrive at your formula. (1/2) ¤

8. The Swedish hockey team (Three Crowns) beat the US hockey team with 6–2. In spite of the fact that the goalkeeper let in two goals he stopped 92 % of all the shots on goal. How many shots on goal did the goalkeeper get? (1/1)

9. Maria is on a hockey team. At first there were 20 players on the team and the average age was 20. Two of the players quit and the average age fell to 19. How old may the two players who quit have been? (1/2)

10. Anja Pärson won her first downhill race in the spring of 2005. Her average speed in this contest was 102 km/h. Anja's time was 24 hundredths (0.24 seconds) better than the skier who came in second. What distance did Anja go in 0.24 seconds?

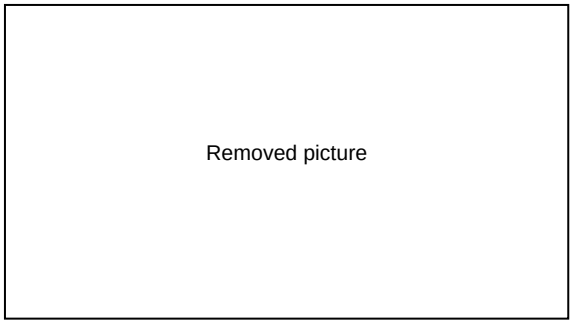
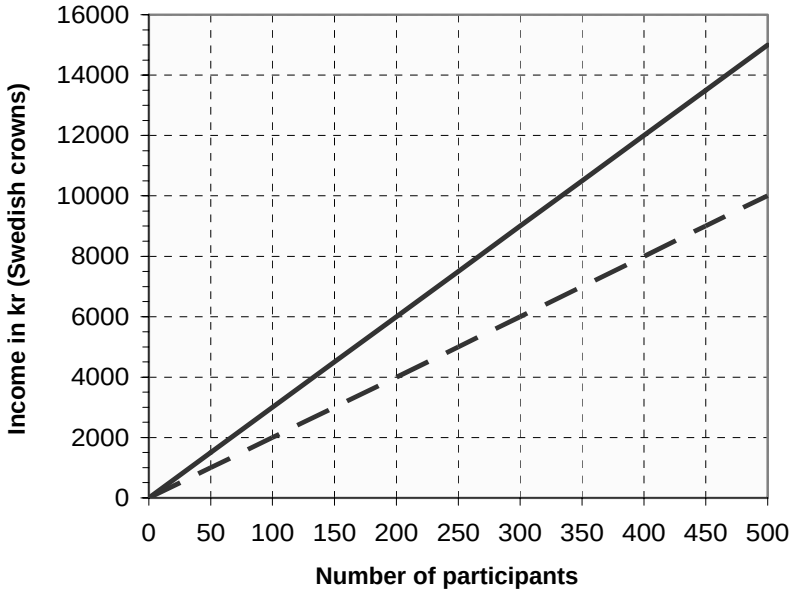


Photo: T Coex/Scanpix

(0/2) ¤

11. Every year the ski club Åsbacken arranges a contest for children and youth called "Mini-Olympics". The registration fee is higher if you are a junior (11–17 years) than if you are a minor (3–10 years). The diagram shows how the income from the junior group and the minor group depend on the number of participants in each group.



a) What is the registration fee for a junior and a minor respectively? Explain how you reached your answers. (2/0)

b) One year there were 500 children and youth who took part in "Mini-Olympics". The income from the registration fees was 13 110 kr (Swedish crowns) in total. How many minors took part in the games that year? (1/2) ¤